

FCC RADIO TEST REPORT

According to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment : 802.11abgn, USB module
Brand Name : SparkLAN
Model No. : WUBR-508N
Filing Type : New Application
Applicant : SparkLAN Communications, Inc.
Manufacturer : 8F., No. 257, Sec. 2, Tiding Blvd., Neihs District,
Taipei City 11493, Taiwan
FCC ID : RYK-WUBR508N
Received Date : Mar. 29, 2012
Final Test Date : May 14, 2012

Statement

Test result included in this report is only for printed antenna (802.11a/n Band 1 to 3) of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart E**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



SPORTON International Inc.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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History of This Test Report

Original Issue Date: May 15, 2012

Report No.: FR232843AN

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

According to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment : 802.11abgn, USB module

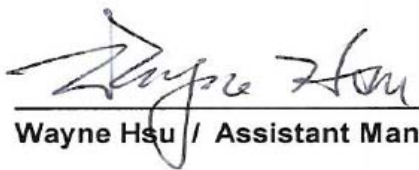
Brand Name : SparkLAN

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8F., No. 257, Sec. 2, Tiding Blvd., Neihu District,
Taipei City 11493, Taiwan

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 29, 2012 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Wayne Hsu / Assistant Manager

SPORTON International Inc.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

1 SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	15.207	AC Power Line Conducted Emissions	Complies	15.62 dB
3.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
3.3	15.407(a)	Maximum Conducted Output Power	Complies	3.34 dB
3.4	15.407(a)	Power Spectral Density	Complies	0.01 dB
3.5	15.407(a)	Peak Excursion	Complies	4.85 dB
3.6	15.407(b)	Radiated Emissions	Complies	1.02 dB
3.7	15.407(b)	Band Edge Emissions	Complies	4.29 dB
3.8	15.407(g)	Frequency Stability	Complies	-
3.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2 GENERAL INFORMATION

2.1 Product Details

There are three types of the EUT. The difference between these three types is connector; we chose the full function type to test. Only the radio detail of IEEE 802.11a/n is shown in this report. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	From system
Data Modulation Data Rate (Mbps)	OFDM for IEEE 802.11a (BPSK / QPSK / 16QAM / 64QAM) (6/9/12/18/24/36/48/54) See the below table for IEEE 802.11n
Frequency Range	5150~5250MHz ; 5250~5350MHz ; 5470~5725MHz
Channel Band Width (99%)	802.11a : Band 1: 16.90 MHz ; Band 2: 17.00 MHz ; Band 3: 16.90 MHz 802.11n : MCS 8 (20MHz) : Band 1: 17.60 MHz ; Band 2: 17.70 MHz MCS 8 (20MHz) : Band 3: 17.60 MHz MCS 8 (40MHz) : Band 1: 36.20 MHz ; Band 2: 37.80 MHz MCS 8 (40MHz) : Band 3: 36.20 MHz
Conducted Output Power	802.11a : Band 1: 13.02 dBm ; Band 2: 17.21 dBm ; Band 3: 13.68 dBm 802.11n : MCS 8 (20MHz) : Band 1: 12.53 dBm ; Band 2: 19.82 dBm ; MCS 8 (20MHz) : Band 3: 19.18 dBm MCS 8 (40MHz) : Band 1: 15.58 dBm ; Band 2: 18.33 dBm ; MCS 8 (40MHz) : Band 3: 18.54 dBm

IEEE 802.11n Modulation Scheme

MCS	Spatial	Modulation	Coding Rate	Data rate(Mbps)	
Index	Streams	Type	Type	20 MHz channel 800nsGI	40 MHz channel 800nsGI
0	1	BPSK	1/2	6.5	13.5
1	1	QPSK	1/2	13	27
2	1	QPSK	3/4	19.5	40.5
3	1	16-QAM	1/2	26	54
4	1	16-QAM	3/4	39	81
5	1	64-QAM	2/3	52	108
6	1	64-QAM	3/4	58.5	121.5
7	1	64-QAM	5/6	65	135
8	2	BPSK	1/2	13	27
9	2	QPSK	1/2	26	54
10	2	QPSK	3/4	39	81
11	2	16-QAM	1/2	52	108
12	2	16-QAM	3/4	78	162
13	2	64-QAM	2/3	104	216
14	2	64-QAM	3/4	117	243
15	2	64-QAM	5/6	130	270

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

2.2 Table for Filed Antenna

Antenna Category (Ant. Cat.)	
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input checked="" type="checkbox"/>	Temporary RF connector provided

Transmitter Outputs & Receiver Inputs Information			
Modulation	Transmitter Outputs	Receiver Inputs	Transmitter Output Signals
802.11a	1	1	-
802.11n HT20 / HT40	2	2	-

Antenna General Information									
Antenna Port (Total 2 Port)					1(TX/RX), 2(TX/RX)				
Maximum RF Output Power Level (PL)					1				
Transmit Chains Power Distribution					<input checked="" type="checkbox"/> symmetrical distribution <input type="checkbox"/> asymmetrical distribution				
Ant. No.	PL	Ant. Port [Ant No. X connect to Ant. Port Y]	Ant. Cat.	Ant. Type	Brand	Model	G _{ANT} (dBi)	DG (dBi) [correlated] N _{TX} = 1	DG (dBi) [uncorrelated] N _{TX} = 2
1	1	1	Internal	Printed	SparkLAN	WUBR-508N	6.64	N/A	6.64
	1	2	Internal	Printed	SparkLAN	WUBR-508N	6.64		
<input checked="" type="checkbox"/> EUT is consist of multiple antenna models assembly (multiple antenna models are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. Then Ant. No. <u>1</u> shall be performed the radiated test.									
<input checked="" type="checkbox"/> The equipment is normally installed and point-to-point or point-to-multipoint systems: Ant. No. <u>1</u>									
Note 1: For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows: Any transmit signals are correlated, Directional Gain (DG) = G _{ANT} + 10 log(N) dBi All transmit signals are completely uncorrelated, Directional Gain (DG)= G _{ANT}									
Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows: Any transmit signals are correlated, Directional Gain (DG) = 10 log[(10 ^{G_{1/20}} + 10 ^{G_{2/20}} + ... + 10 ^{G_{N/20}}) ² /N] dBi All transmit signals are completely uncorrelated, Directional Gain (DG) = 10 log[(10 ^{G_{1/10}} + 10 ^{G_{2/10}} + ... + 10 ^{G_{N/10}})/N] dBi									

**The EUT was pre-tested antenna port 1 and antenna port 2 for single chain, the worst case was antenna port 2. therefore only the test data recorded in this report.

2.3 Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency (20MHz)	Channel No.	Frequency (40MHz)
5150~5250 MHz Band 1	36	5180 MHz	38	5190 MHz
	40	5200 MHz	46	5230 MHz
	44	5220 MHz	-	-
	48	5240 MHz	-	-

Frequency Band	Channel No.	Frequency (20MHz)	Channel No.	Frequency (40MHz)
5250~5350 MHz Band 2	52	5260 MHz	54	5270 MHz
	56	5280 MHz	62	5310 MHz
	60	5300 MHz	-	-
	64	5320 MHz	-	-

Frequency Band	Channel No.	Frequency (20MHz)
5470~5725 MHz Band 3	100	5500 MHz
	104	5520 MHz
	108	5540 MHz
	112	5560 MHz
	116	5580 MHz
	132	5660 MHz
	136	5680 MHz
	140	5700 MHz
	Channel No.	Frequency (40MHz)
	102	5510 MHz
	110	5550 MHz
	134	5670 MHz

2.4 Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on the entire possible Configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
AC Power Conducted Emission Radiated Emission Below 1GHz	System Mode	Auto	-
Max. Conducted Output Power 26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (20MHz)	6.5 Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (40MHz)	13.5 Mbps	38/46/54/62/102/110/134
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/110/134
Radiated Emission Above 1GHz	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (20MHz)	6.5 Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (40MHz)	13.5 Mbps	38/46/54/62/102/110/134
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/110/134
Band Edge Emission	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (20MHz)	6.5 Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 0 (40MHz)	13.5 Mbps	38/46/54/62/102/110/134
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/56 /64/100/116/140
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/110/134

2.5 Table for Testing Locations

Test Site No.	Site Category	Location
CO01-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya
03CH02-HY	SAC	Hwa Ya

Semi Anechoic Chamber (SAC).

2.6 Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	VOSTRO 3350	DoC
(USB) Mouse	Microsoft	1113	JNZ211443
iPod nano	Apple	A1199	N/A
Wireless AP (Remote Workstation)	D-Link	DNS-G120	DoC

2.7 Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For Single Chain:

Power Parameters of IEEE 802.11a Port 2

Test Software Version	RT 5x7x QA		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11a	1C	1E	20
Frequency	5260 MHz	5280 MHz	5320 MHz
IEEE 802.11a	24	25	24
Frequency	5500 MHz	5580 MHz	5700 MHz
IEEE 802.11a	1E	21	18

For Two Chains:

Power Parameters of IEEE 802.11n (20MHz) Port 1 + Port 2

Test Software Version	RT 5x7x QA		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11n	18;18	1A;1A	1D;1D
Frequency	5260 MHz	5280 MHz	5320 MHz
IEEE 802.11n	2B;2B	2B;2B	2B;2B
Frequency	5500 MHz	5580 MHz	5700 MHz
IEEE 802.11n	29;29	29;29	29;29

Power Parameters of IEEE 802.11n (40MHz) Port 1 + Port 2

Test Software Version	RT 5x7x QA		
Frequency	5190 MHz	5230 MHz	5270 MHz
IEEE 802.11n	21;21	21;21	2B;2B
Frequency	5310 MHz	5510 MHz	5550 MHz
IEEE 802.11n	2B;2B	2B;2B	2B;2B
Frequency	5670 MHz		
IEEE 802.11n	2B;2B		

2.8 EUT Operation during Test

Conducted emissions and radiated emissions 9kHz~1GHz

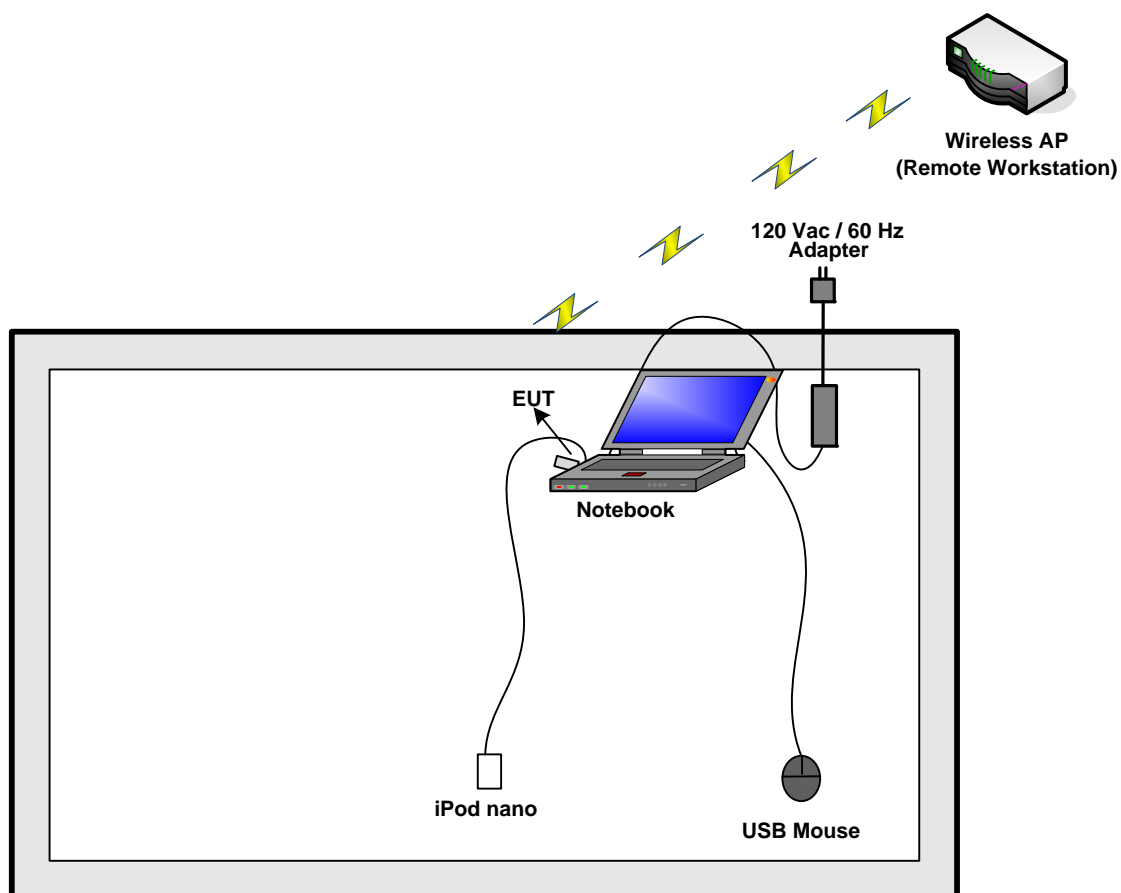
Two executive programs, "EMITEST.exe" and "EMCTEST.exe" under Win XP, which generates a complete line of continuously repeating "H" pattern was used as the test software.

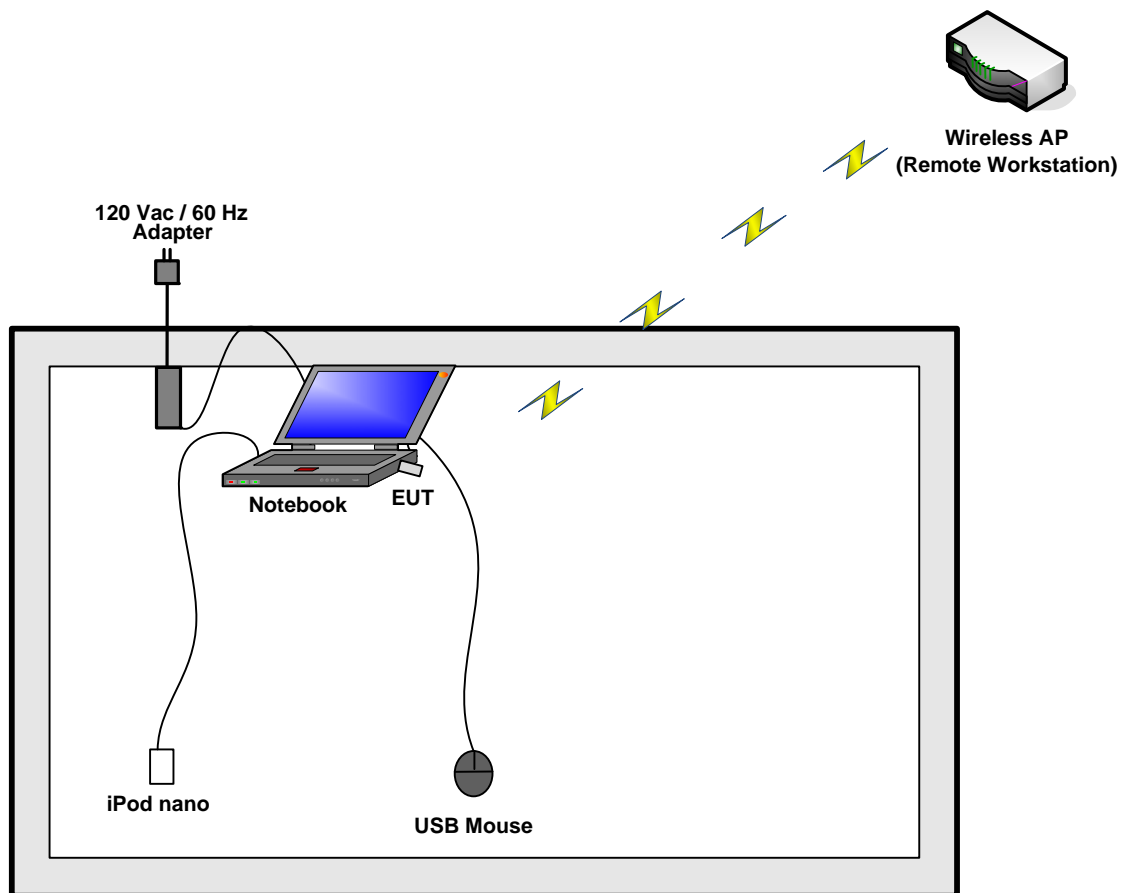
The program was executed as follows:

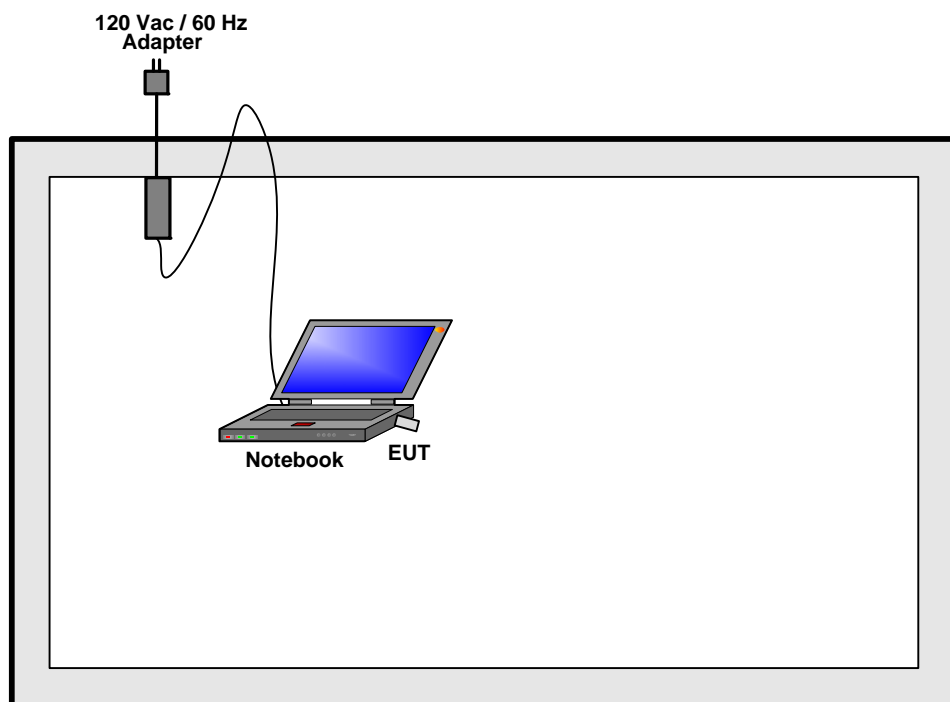
- a. Turn on the power of all equipment.
- b. The NB executed "Winthrax.exe" to read/write data from EUT.
- c. The NB executed "EMITEST.exe" sends "H" messages to the panel and displays "H" patterns on the screen.
- d. The EUT connect to remote workstation (Wireless AP) via WiFi.

Radiated emissions above 1GHz

The Notebook executed "RT 5x7x QA" to EUT keep transmitting signals at fixed frequency via wireless.

2.9 Test Configuration**Conducted emissions**

Radiated emissions 9kHz~1GHz

Radiated emissions above 1GHz

3 TEST RESULT

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Class B

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2 Measuring Instruments and Setting

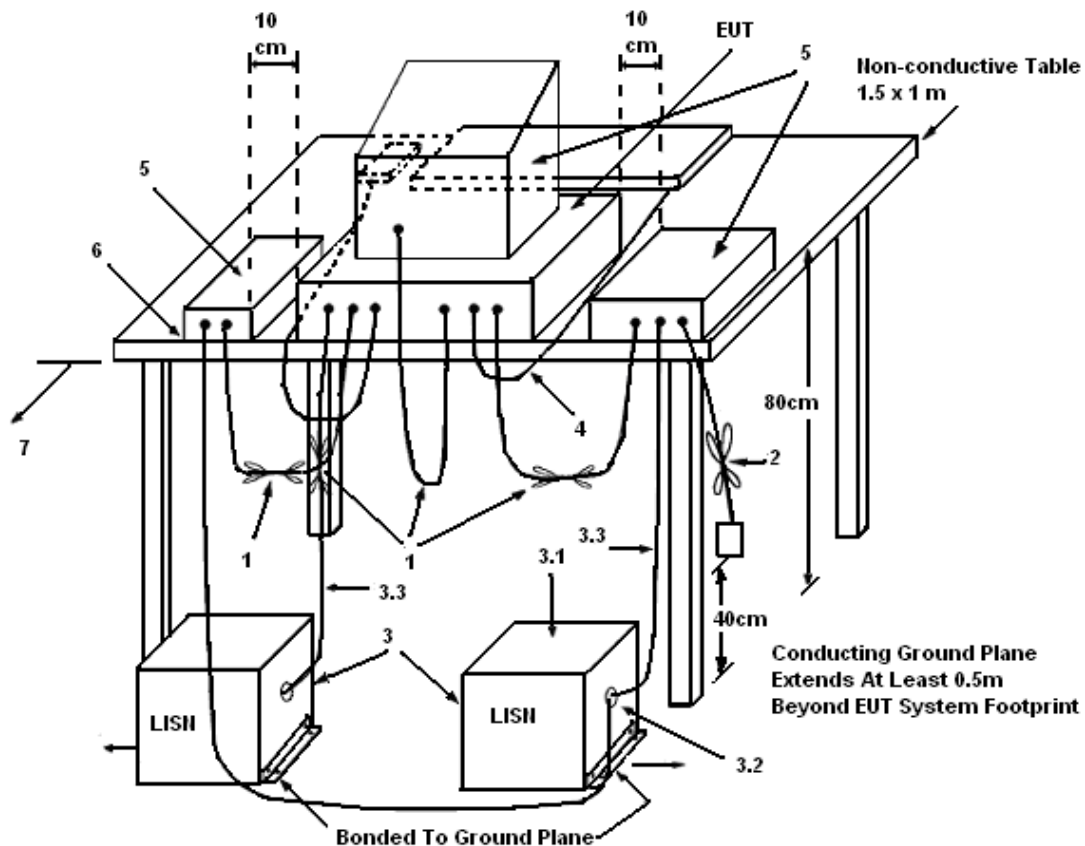
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.1.3 Test Procedures

1. The EUT was warmed up for 15 minutes before testing started.
2. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connect to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The CISPR states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.1.4 Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5 Test Deviation

There is no deviation with the original standard.

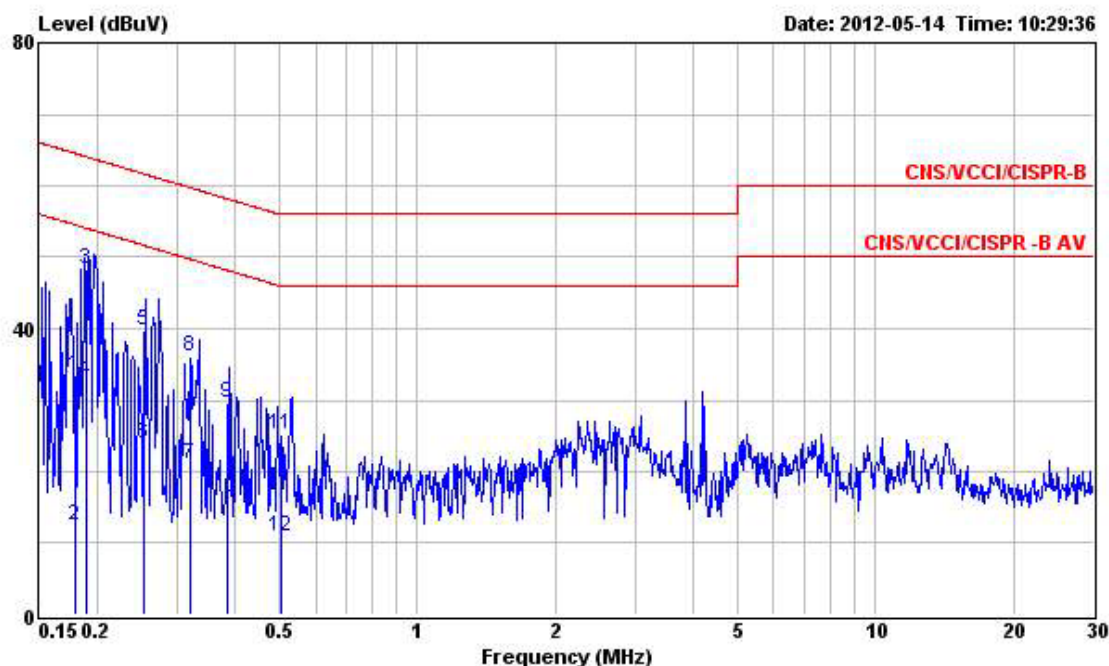
3.1.6 EUT Operation during Test

The EUT was placed on the test table and programmed in transmitting function.

3.1.7 Results of AC Power Line Conducted Emissions Measurement

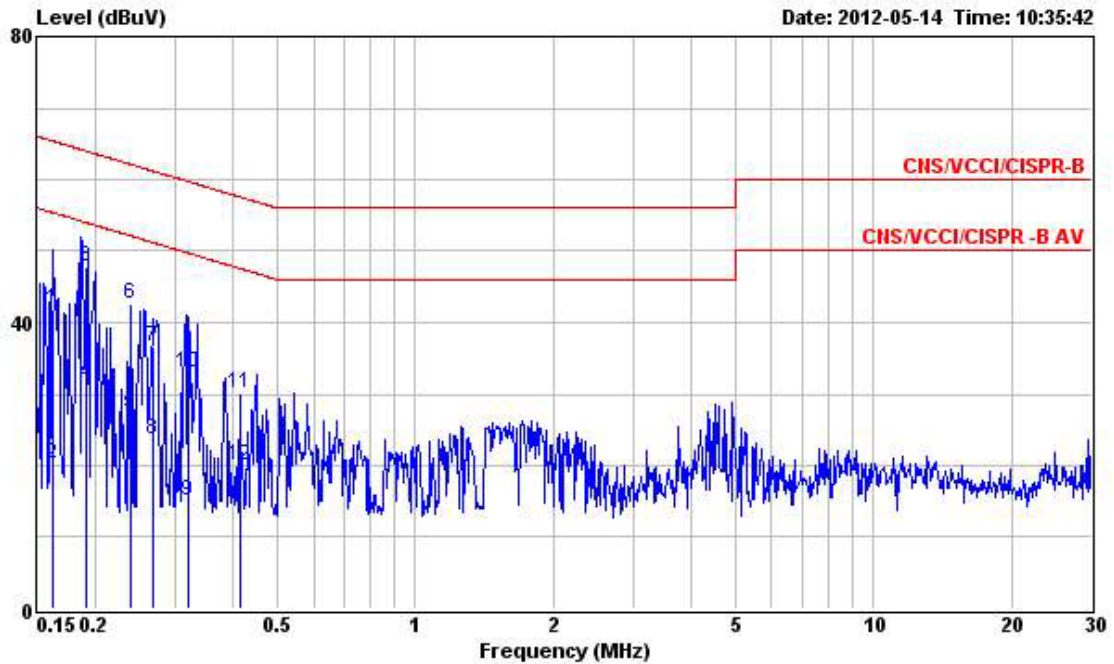
Final Test Date	May 14, 2012	Test Site No.	CO01-HY
Temperature	23.6°C	Humidity	49%
Test Engineer	David	Configuration	System Mode

Line



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.179	33.55	-30.97	64.52	33.37	0.08	0.10	QP
2	0.179	12.50	-42.02	54.52	12.32	0.08	0.10	Average
3	0.190	48.41	-15.62	64.03	48.23	0.08	0.10	QP
4	0.190	32.72	-21.31	54.03	32.54	0.08	0.10	Average
5	0.252	39.65	-22.05	61.70	39.47	0.08	0.10	QP
6	0.252	23.96	-27.74	51.70	23.78	0.08	0.10	Average
7	0.320	21.12	-28.59	49.71	20.93	0.09	0.10	Average
8	0.320	36.04	-23.67	59.71	35.85	0.09	0.10	QP
9	0.386	29.65	-28.49	58.14	29.46	0.09	0.10	QP
10	0.386	16.35	-31.79	48.14	16.16	0.09	0.10	Average
11	0.503	25.13	-30.87	56.00	24.93	0.10	0.10	QP
12	0.503	11.02	-34.98	46.00	10.82	0.10	0.10	Average

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.162	41.94	-23.42	65.36	41.77	0.07	0.10	QP
2	0.162	20.37	-34.99	55.36	20.20	0.07	0.10	Average
3	0.191	47.88	-16.10	63.98	47.72	0.06	0.10	QP
4	0.191	31.51	-22.47	53.98	31.35	0.06	0.10	Average
5	0.238	27.19	-24.97	52.16	27.03	0.06	0.10	Average
6	0.238	42.57	-19.59	62.16	42.41	0.06	0.10	QP
7	0.267	36.55	-24.66	61.21	36.39	0.06	0.10	QP
8	0.267	23.71	-27.50	51.21	23.55	0.06	0.10	Average
9	0.321	15.09	-34.60	49.69	14.92	0.07	0.10	Average
10	0.321	32.95	-26.74	59.69	32.78	0.07	0.10	QP
11	0.413	30.14	-27.45	57.59	29.97	0.07	0.10	QP
12	0.413	20.06	-27.53	47.59	19.89	0.07	0.10	Average

Note:

Level = Read Level + Probe Factor + Cable Loss.

3.2 99% Occupied Bandwidth Measurement

3.2.1 Limit

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

3.2.2 Measuring Instruments and Setting

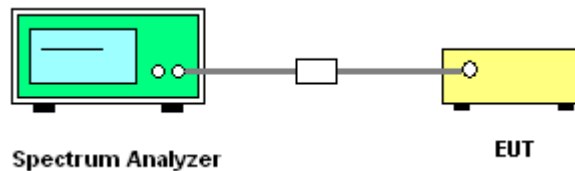
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.2.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.
4. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner. (Only for IEEE 802.11n test)

3.2.4 Test Setup Layout



3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7 Test Result of 99% Occupied Bandwidth

Final Test Date	Apr. 26, 2012	Test Site No.	TH01-HY
Temperature	25.9℃	Humidity	30%
Test Engineer	Ian	Configurations	802.11a/n

For Single Chain:**Configuration of IEEE 802.11a Port 2**

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.30	16.80
40	5200 MHz	23.30	16.90
48	5240 MHz	20.20	16.80
52	5260 MHz	27.90	16.80
56	5280 MHz	22.40	17.00
64	5320 MHz	19.90	16.80
100	5500 MHz	20.20	16.80
116	5580 MHz	20.00	16.80
140	5700 MHz	20.16	16.90

For Two Chains:**Configuration IEEE 802.11n Port 1 (20MHz) Port 1**

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	20.60	17.60
40	5200 MHz	20.50	17.60
48	5240 MHz	22.20	17.60
52	5260 MHz	27.70	17.70
56	5280 MHz	25.20	17.70
64	5320 MHz	22.20	17.70
100	5500 MHz	20.70	17.60
116	5580 MHz	20.80	17.60
140	5700 MHz	20.50	17.60

Configuration IEEE 802.11n Port 2 (20MHz) Port 2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	20.00	17.50
40	5200 MHz	20.00	17.60
48	5240 MHz	20.00	17.60
52	5260 MHz	26.70	17.70
56	5280 MHz	20.70	17.60
64	5320 MHz	20.20	17.60
100	5500 MHz	20.10	17.60
116	5580 MHz	19.80	17.60
140	5700 MHz	20.00	17.60

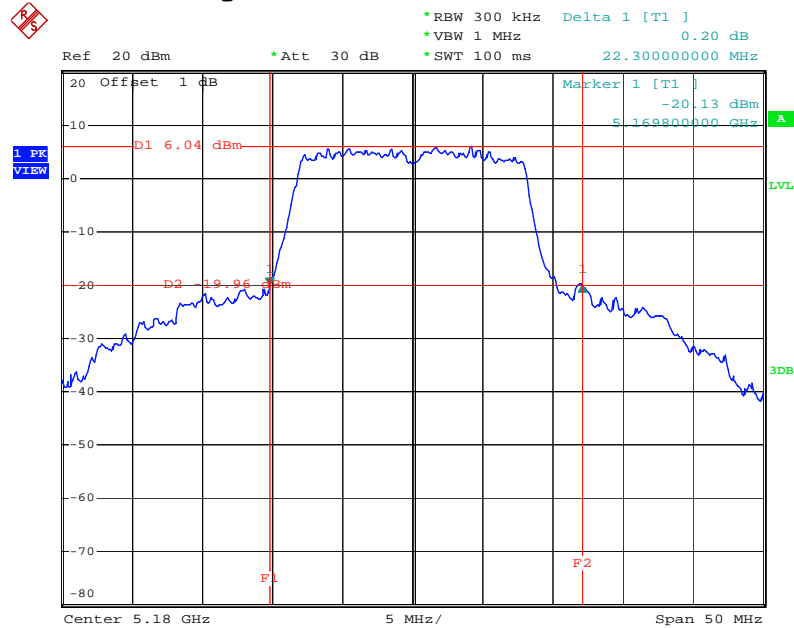
Configuration IEEE 802.11n Port 1 (40MHz) Port 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	40.80	36.00
46	5230 MHz	40.40	36.00
54	5270 MHz	56.00	36.40
62	5310 MHz	51.40	36.40
102	5510 MHz	55.60	36.20
110	5550 MHz	51.20	36.20
134	5670 MHz	40.80	36.20

Configuration IEEE 802.11n Port 2 (40MHz) Port 2

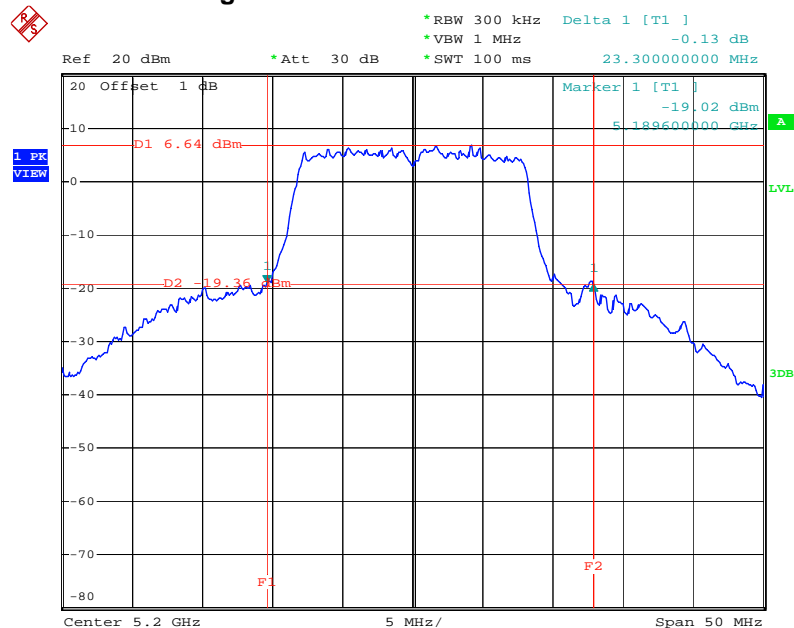
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	40.40	36.20
46	5230 MHz	40.20	36.00
54	5270 MHz	49.40	36.40
62	5310 MHz	41.80	37.80
102	5510 MHz	49.00	36.20
110	5550 MHz	40.64	36.20
134	5670 MHz	40.40	36.20

For Single Chain:
26 dB Bandwidth Plot on Configuration IEEE 802.11a 5180 MHz Port 2



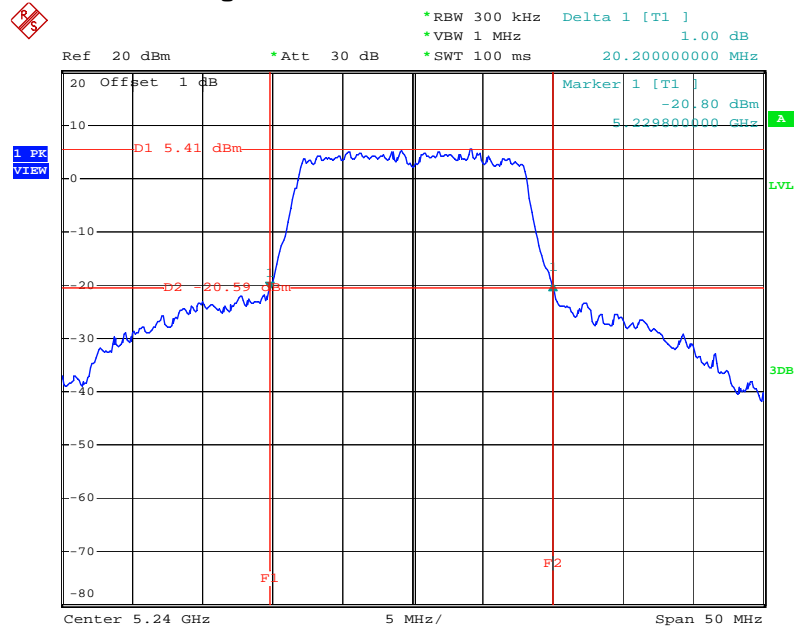
Date: 25.APR.2012 11:53:12

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5200 MHz Port 2



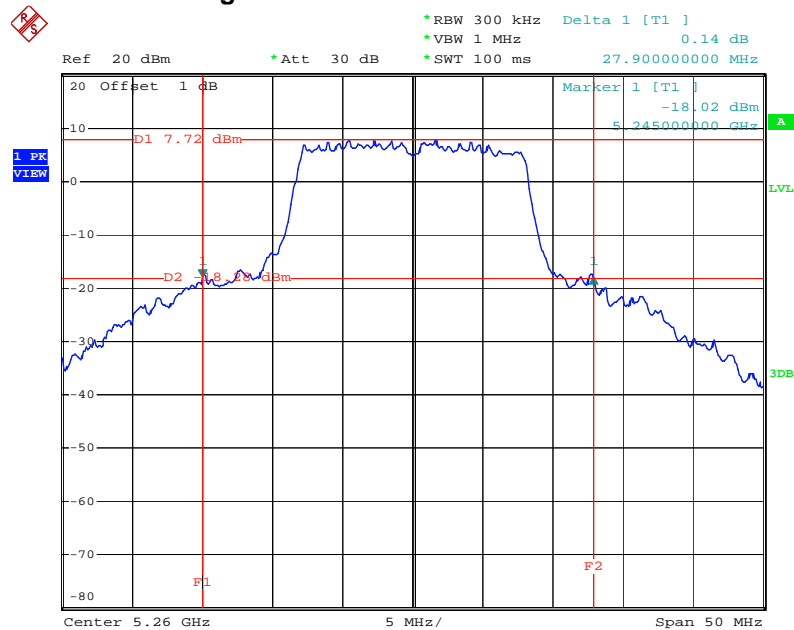
Date: 25.APR.2012 11:57:46

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5240 MHz Port 2



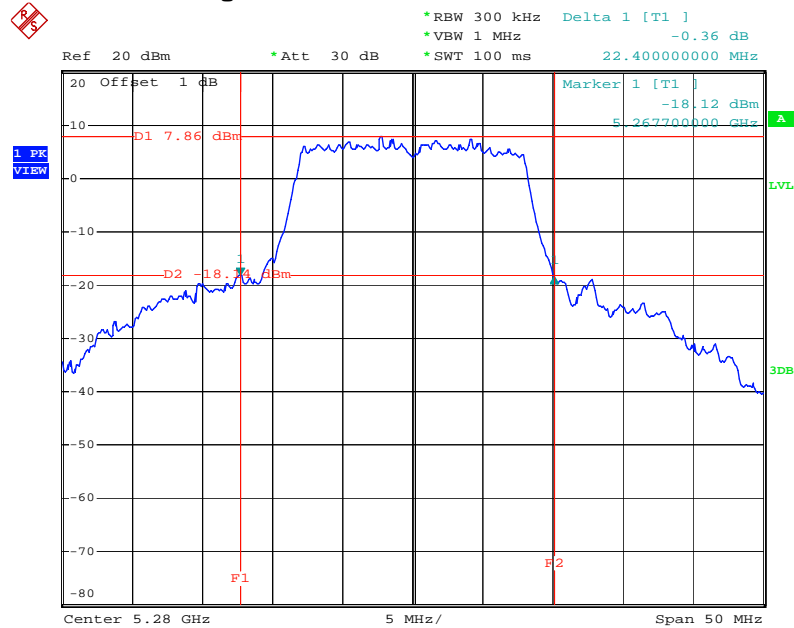
Date: 25.APR.2012 13:45:48

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5260 MHz Port 2



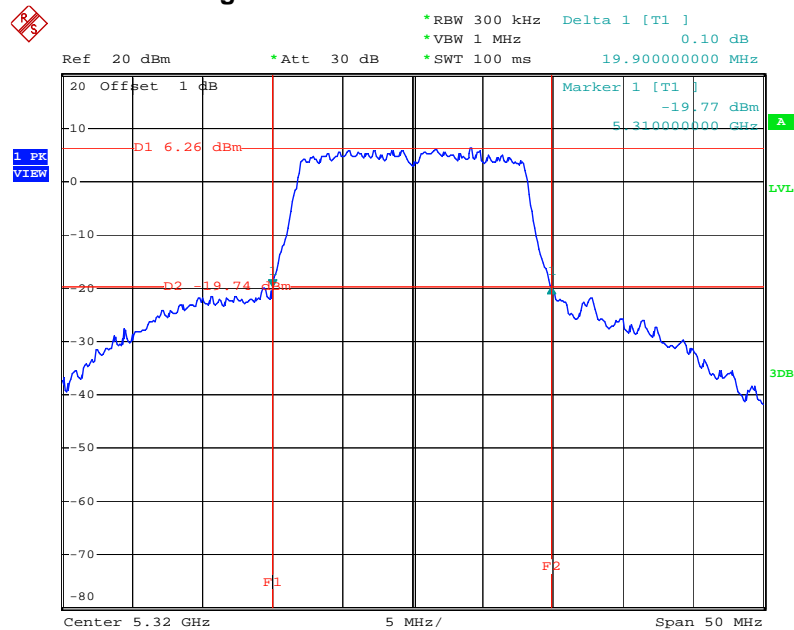
Date: 25.APR.2012 14:22:45

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5280 MHz Port 2



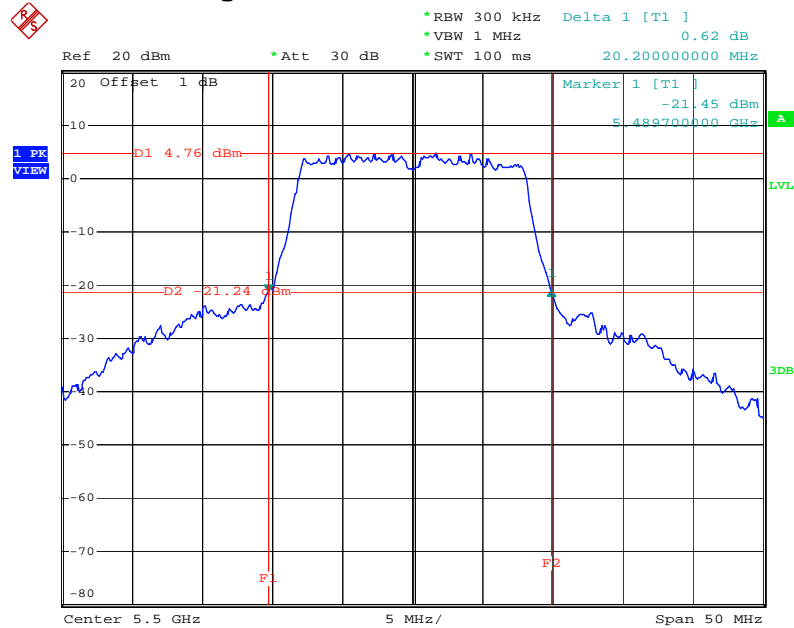
Date: 25.APR.2012 14:25:55

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5320 MHz Port 2



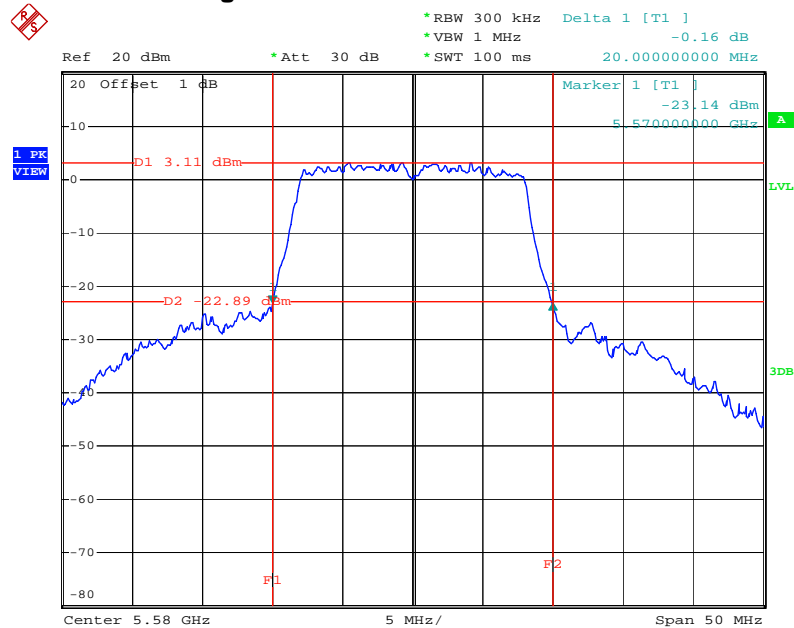
Date: 25.APR.2012 14:29:38

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5500 MHz Port 2



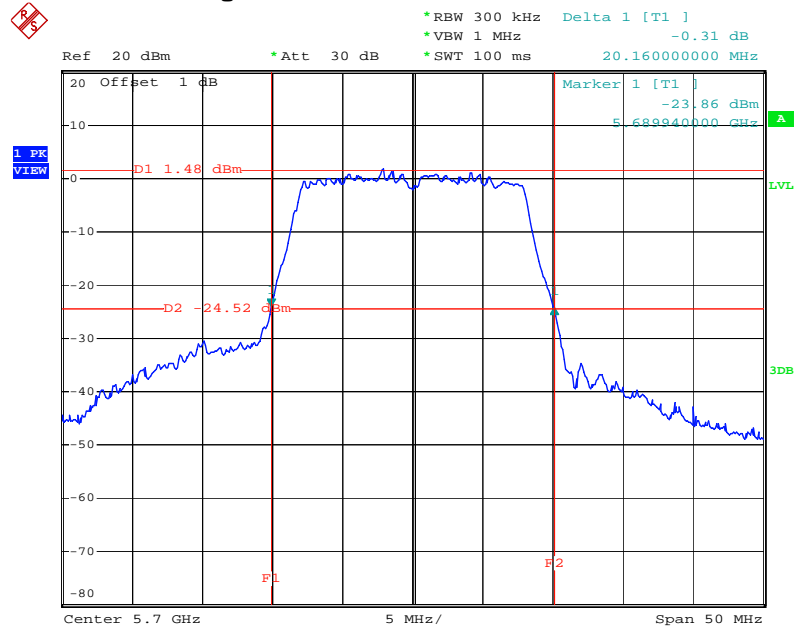
Date: 25.APR.2012 14:33:34

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5580 MHz Port 2



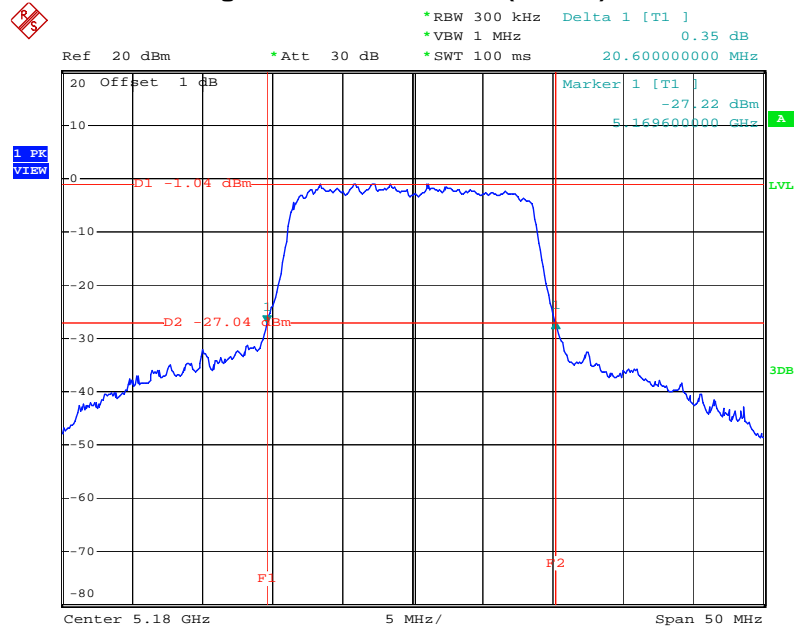
Date: 25.APR.2012 14:38:50

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5700 MHz Port 2



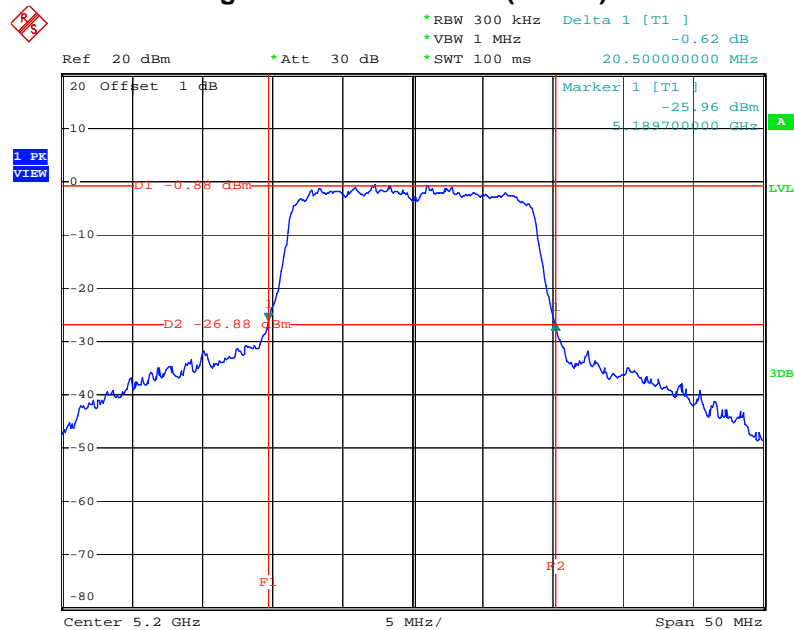
Date: 25.APR.2012 14:41:27

For Two Chains:
26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 1



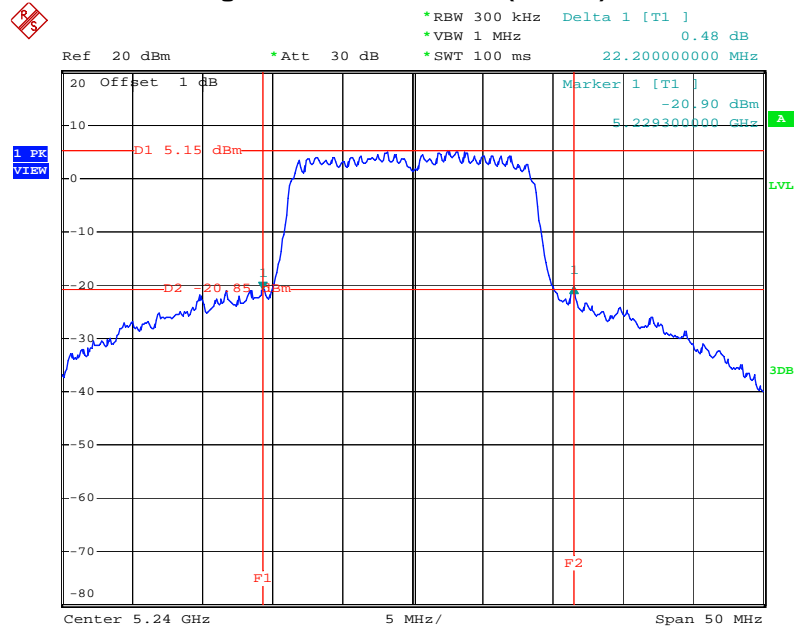
Date: 25.APR.2012 22:12:50

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 1



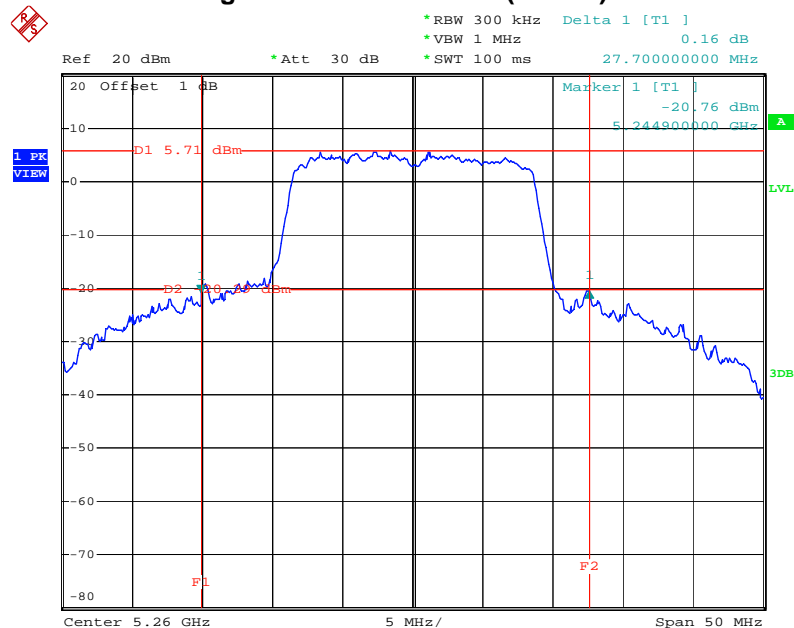
Date: 25.APR.2012 22:14:39

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 1



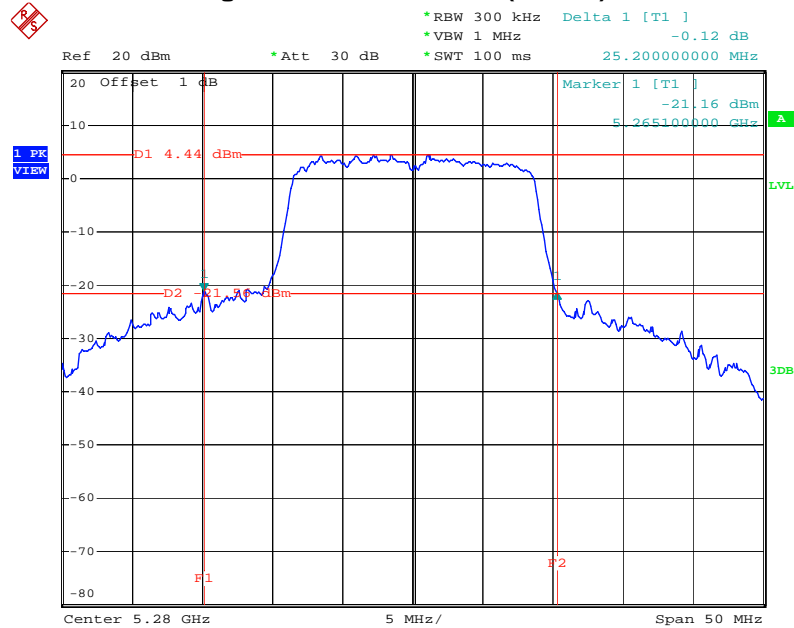
Date: 26.APR.2012 09:56:14

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 1



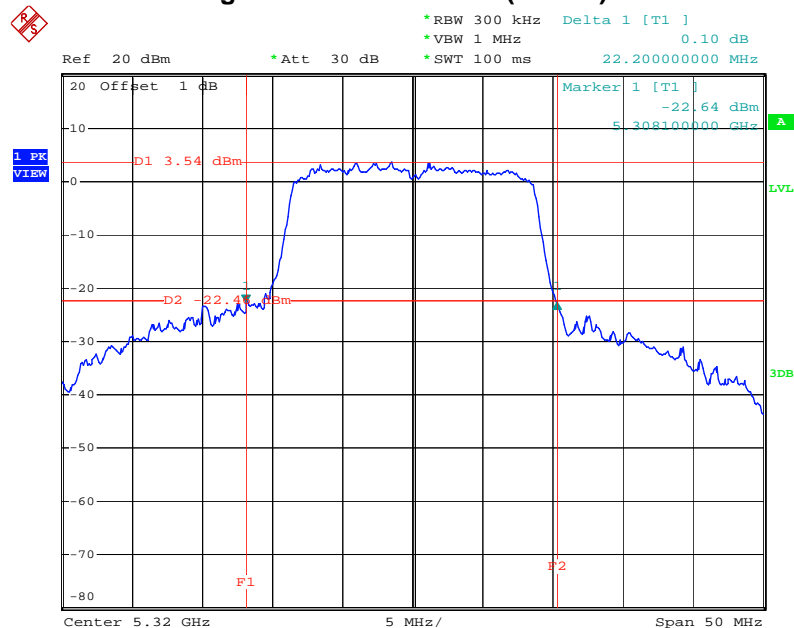
Date: 25.APR.2012 22:19:10

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 1



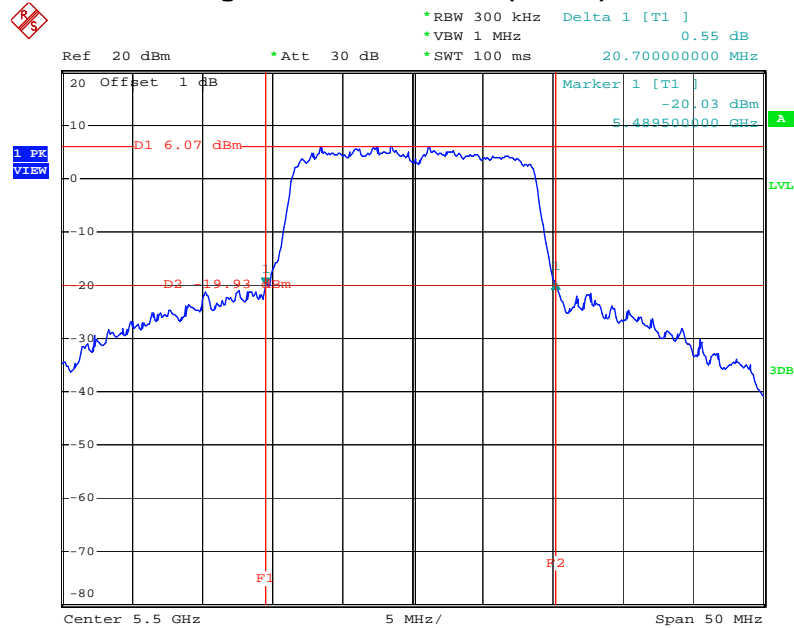
Date: 25.APR.2012 22:21:17

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 1



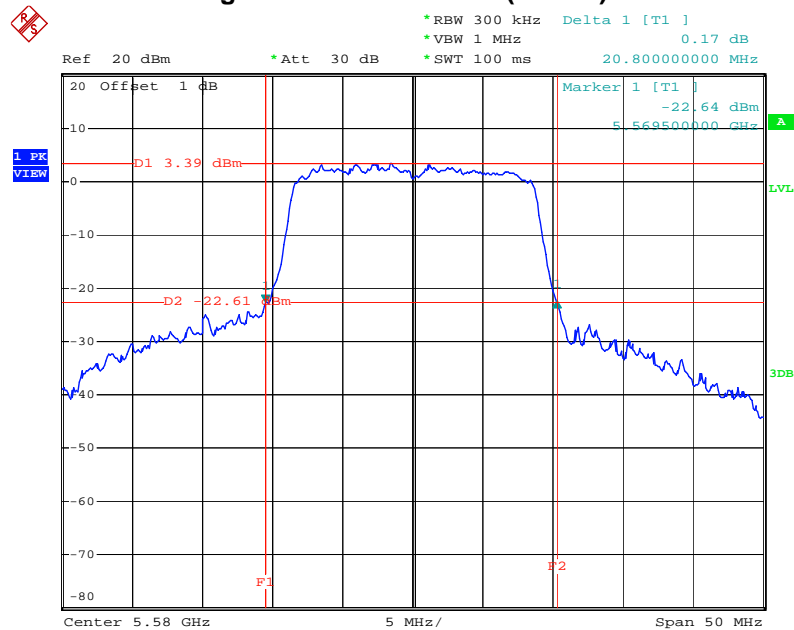
Date: 25.APR.2012 22:23:34

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 1



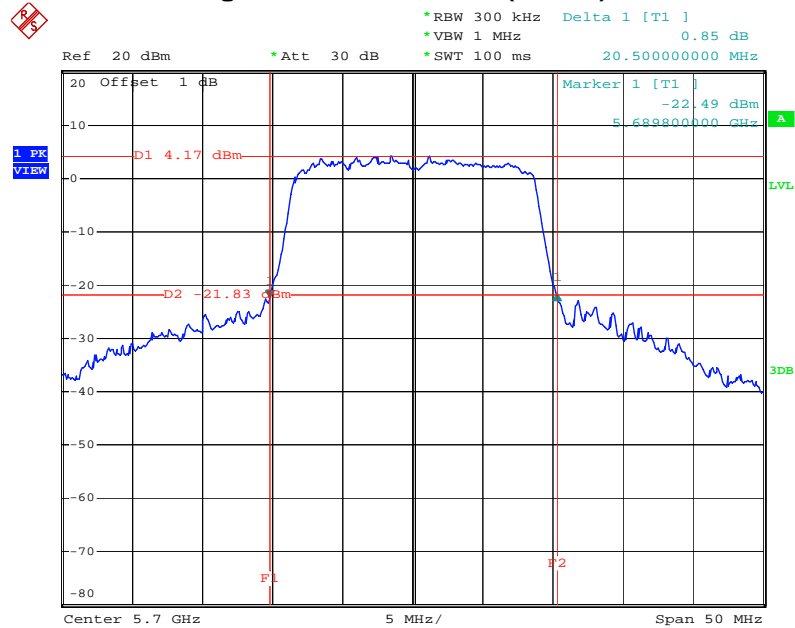
Date: 25.APR.2012 22:25:29

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 1



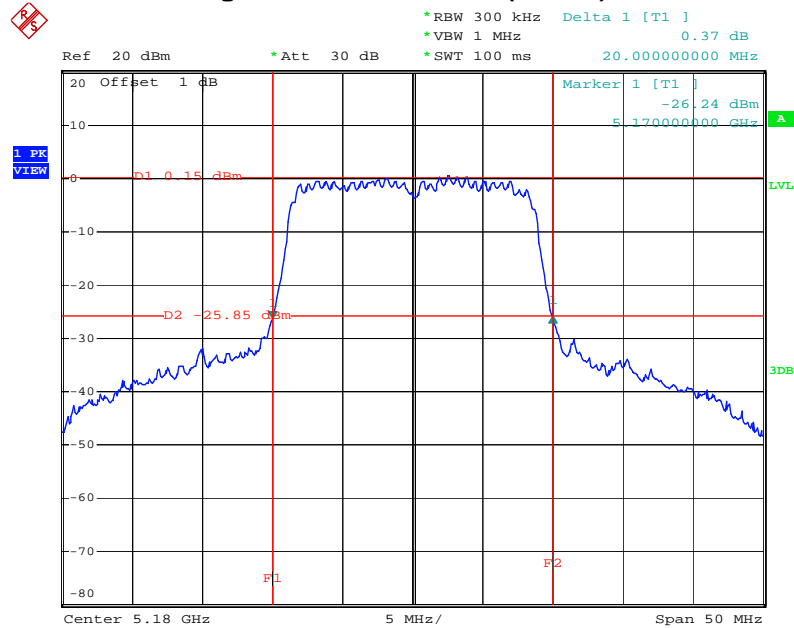
Date: 25.APR.2012 22:27:39

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 1



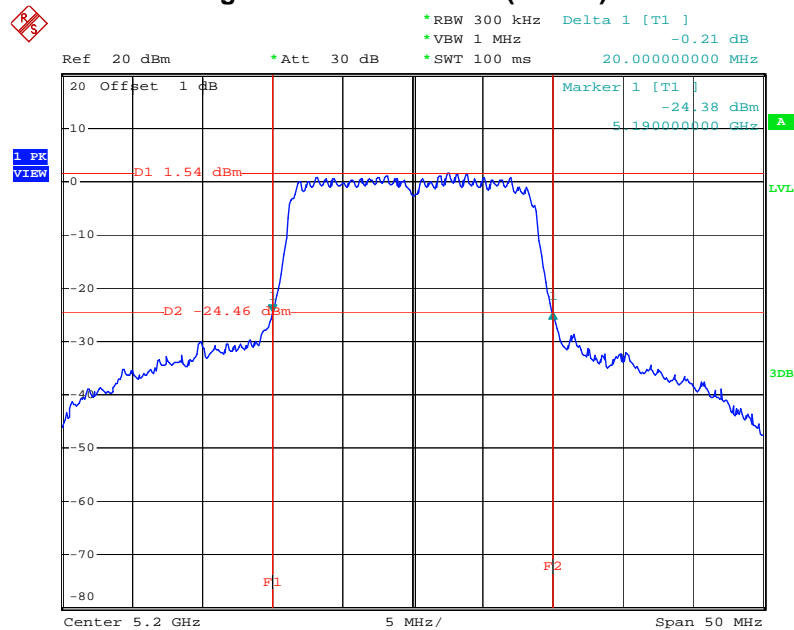
Date: 25.APR.2012 22:29:40

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 2



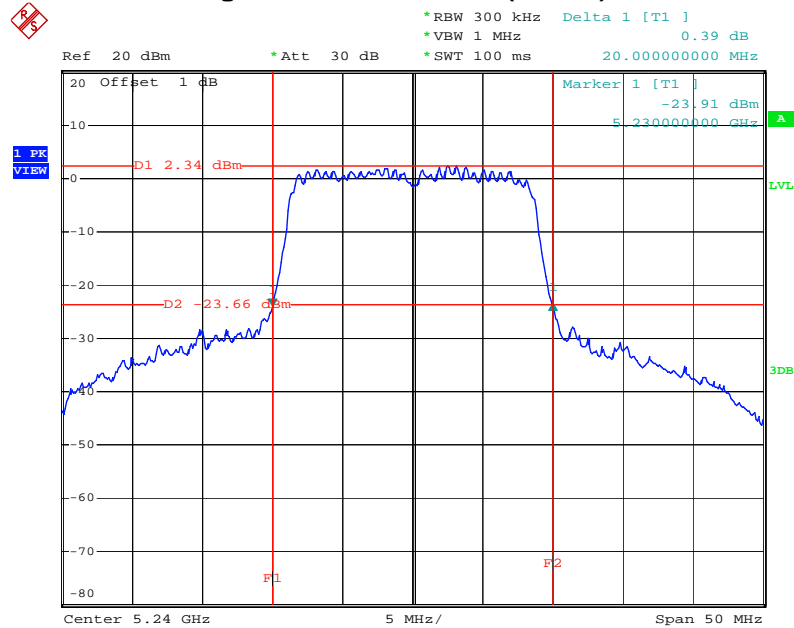
Date: 25.APR.2012 22:52:25

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 2



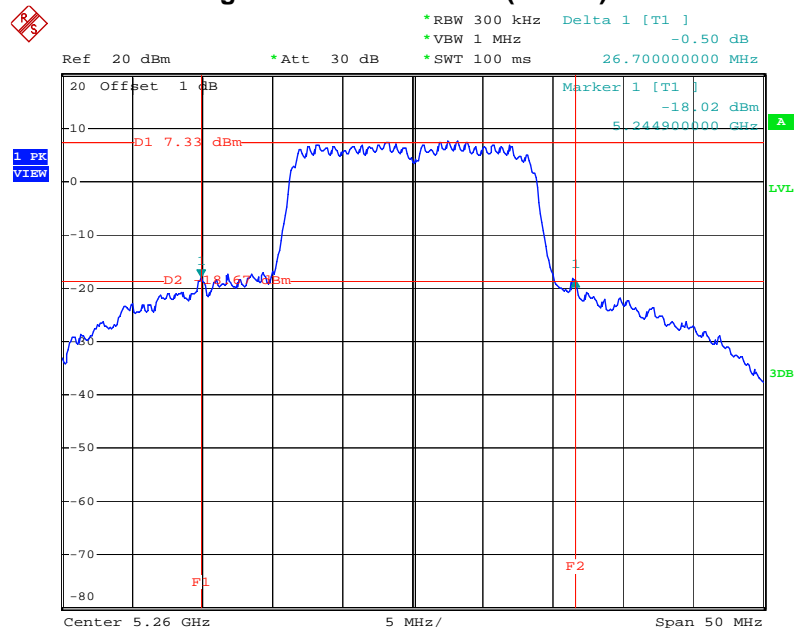
Date: 25.APR.2012 22:54:36

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 2



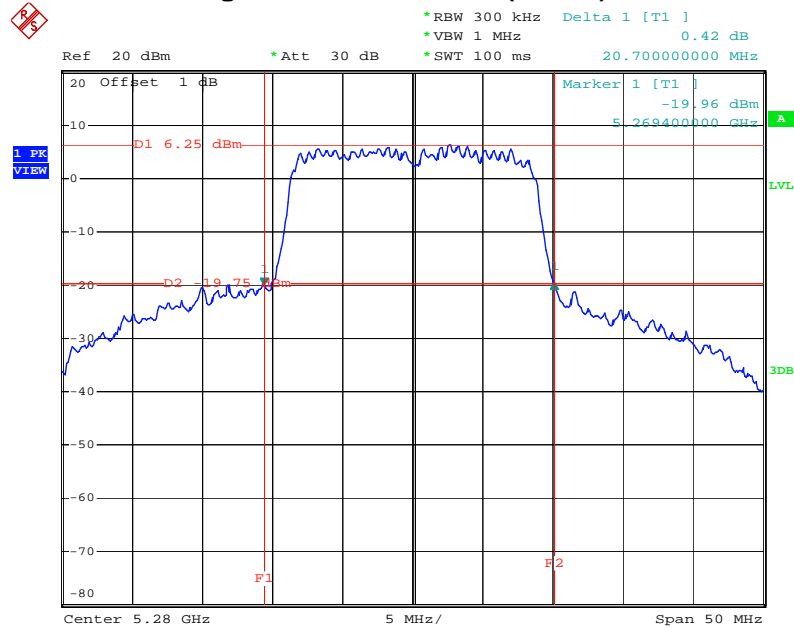
Date: 25.APR.2012 22:58:48

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 2



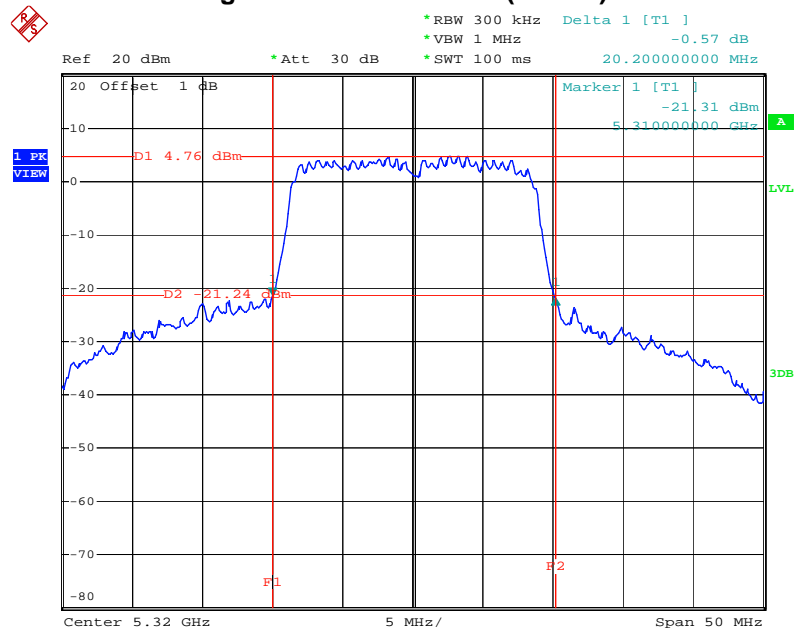
Date: 25.APR.2012 23:01:02

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 2



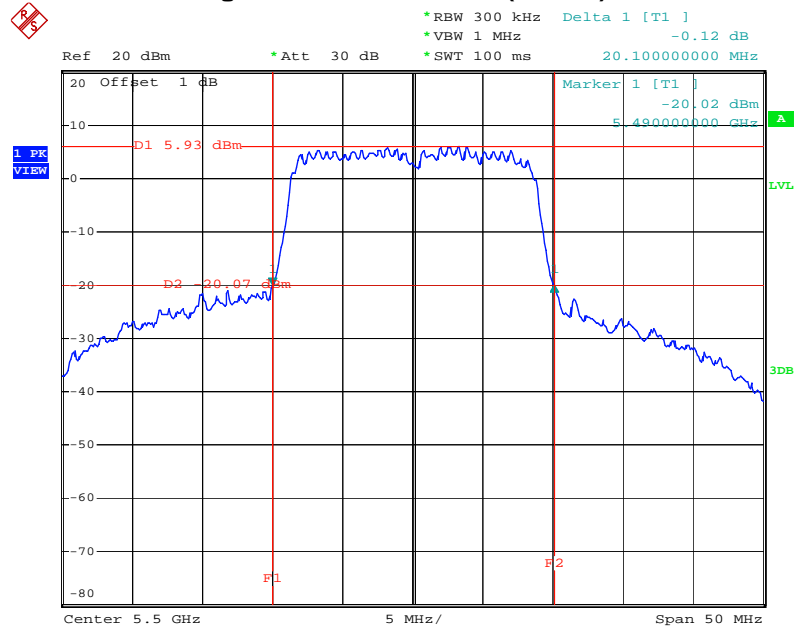
Date: 25.APR.2012 23:03:34

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 2



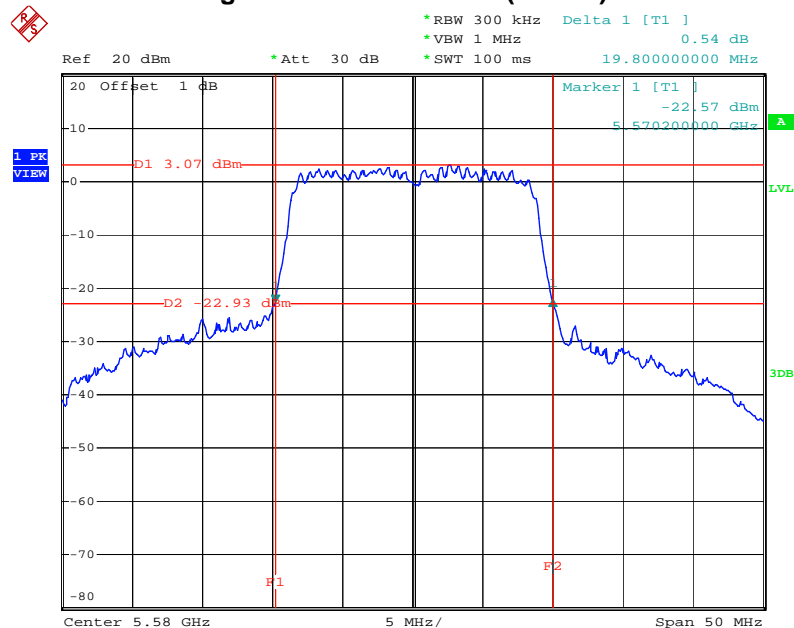
Date: 25.APR.2012 23:06:09

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 2



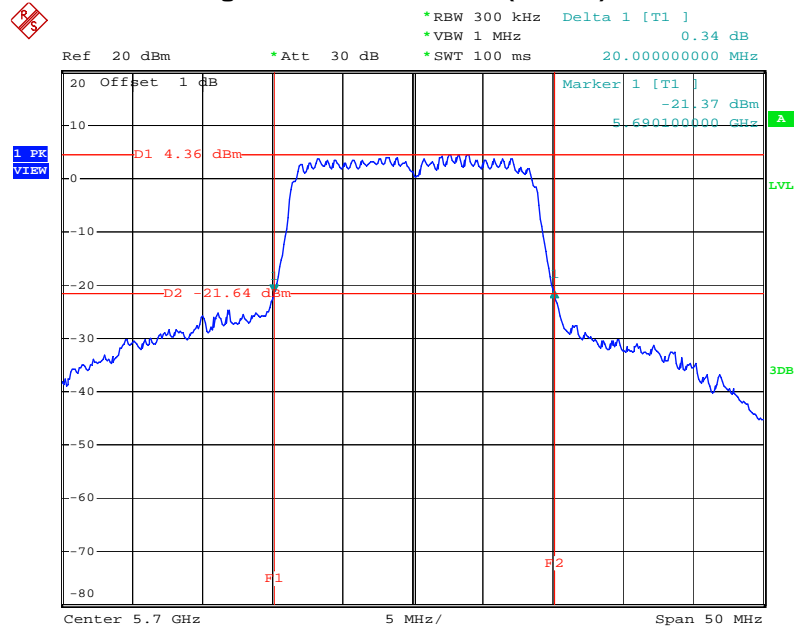
Date: 25.APR.2012 23:09:02

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 2



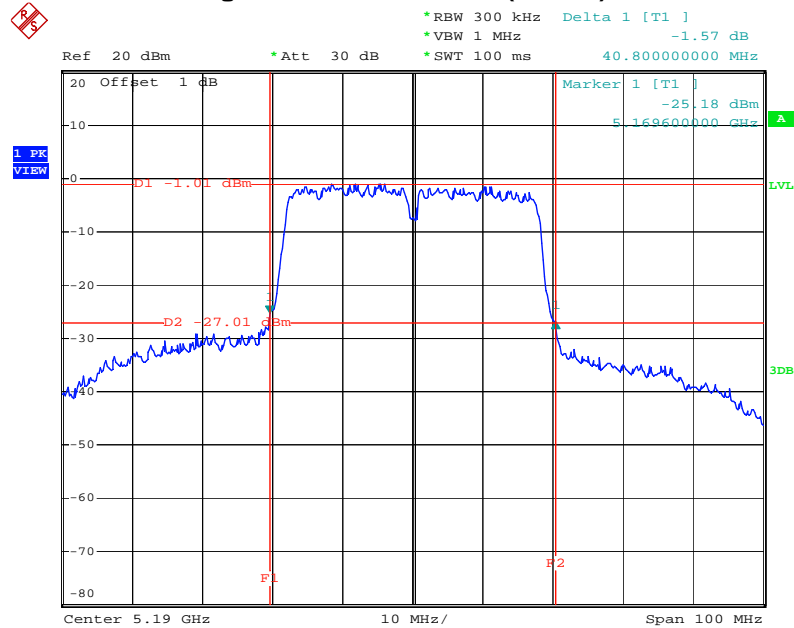
Date: 25.APR.2012 23:11:13

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 2



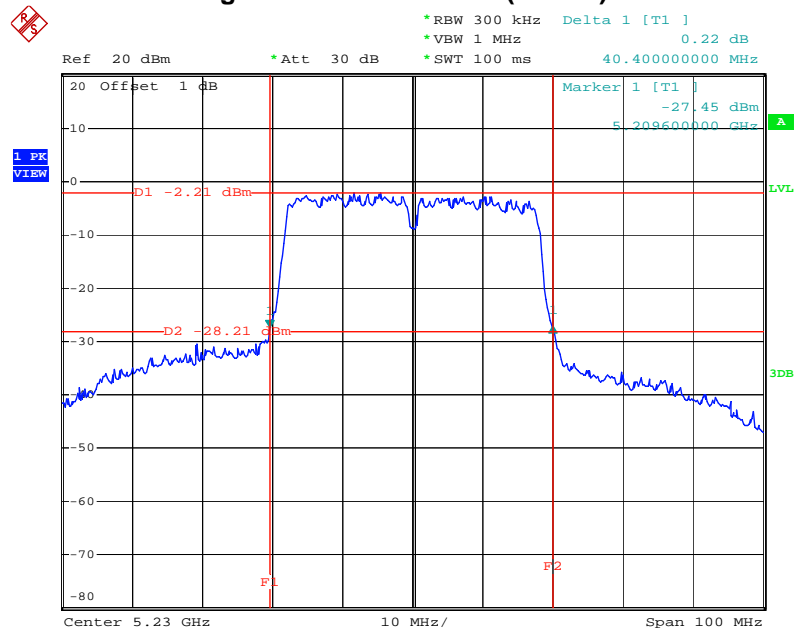
Date: 25.APR.2012 23:13:09

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 1



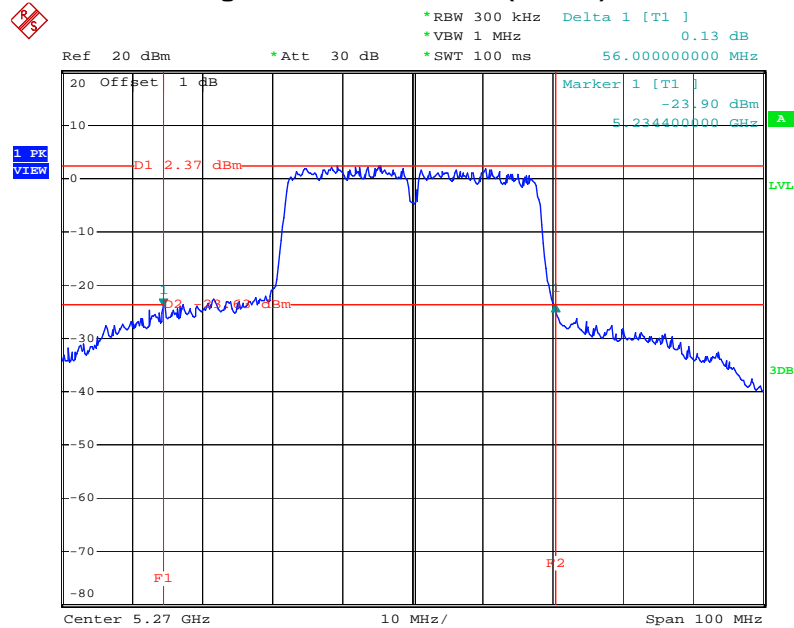
Date: 25.APR.2012 22:31:45

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 1



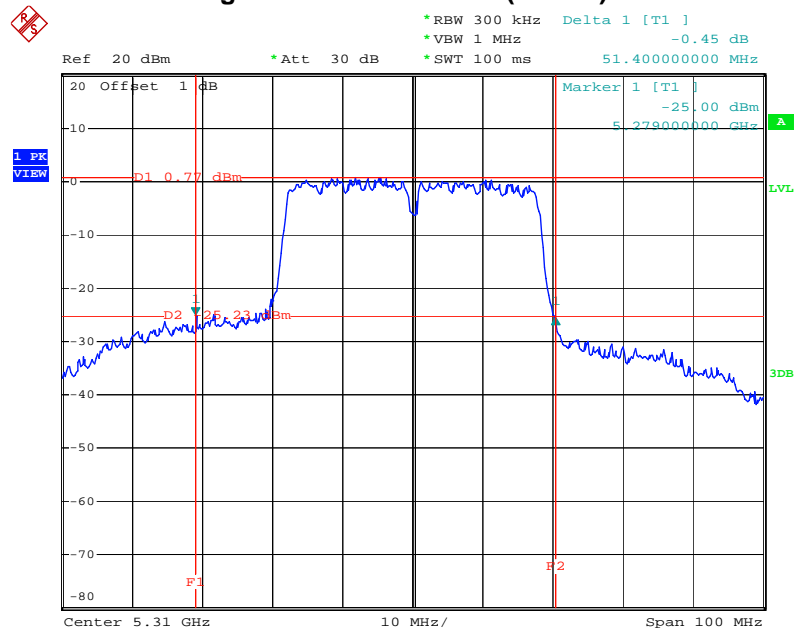
Date: 25.APR.2012 22:34:11

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 1



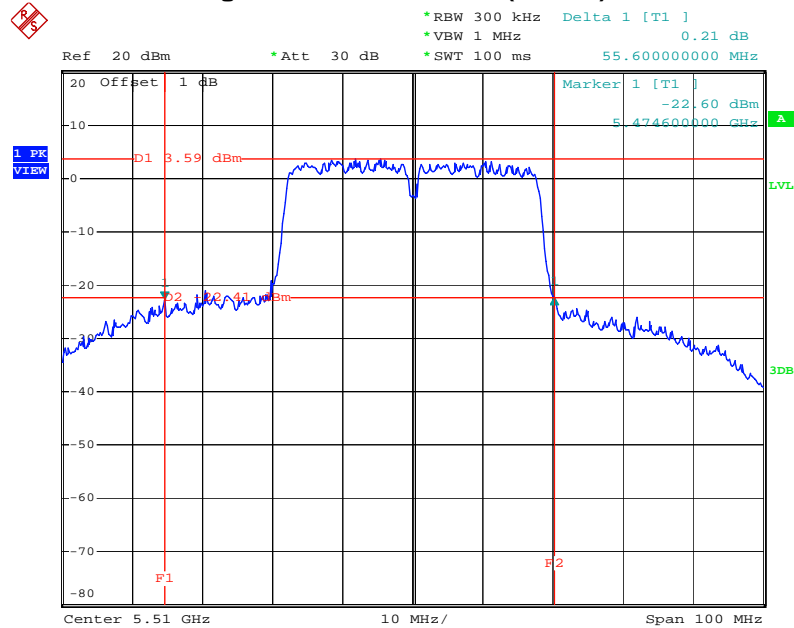
Date: 25.APR.2012 22:36:04

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 1



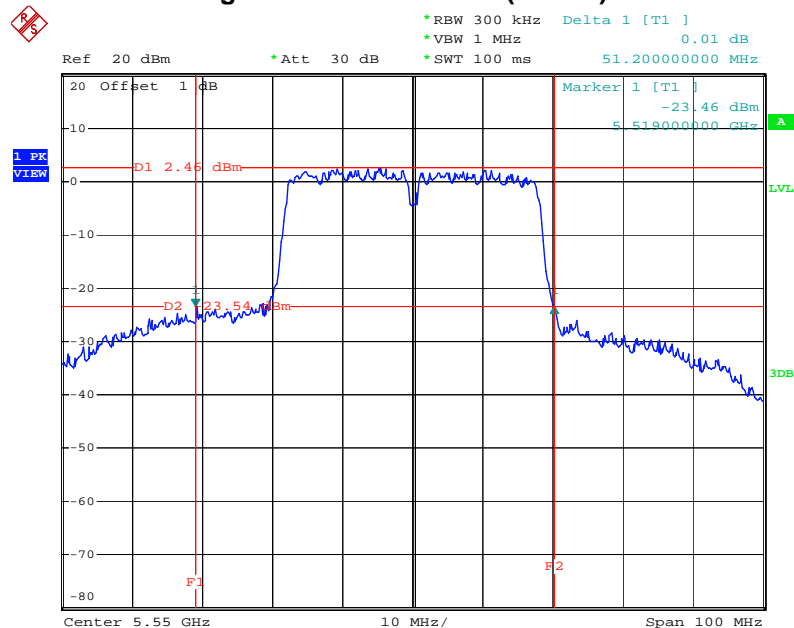
Date: 25.APR.2012 22:38:33

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 1



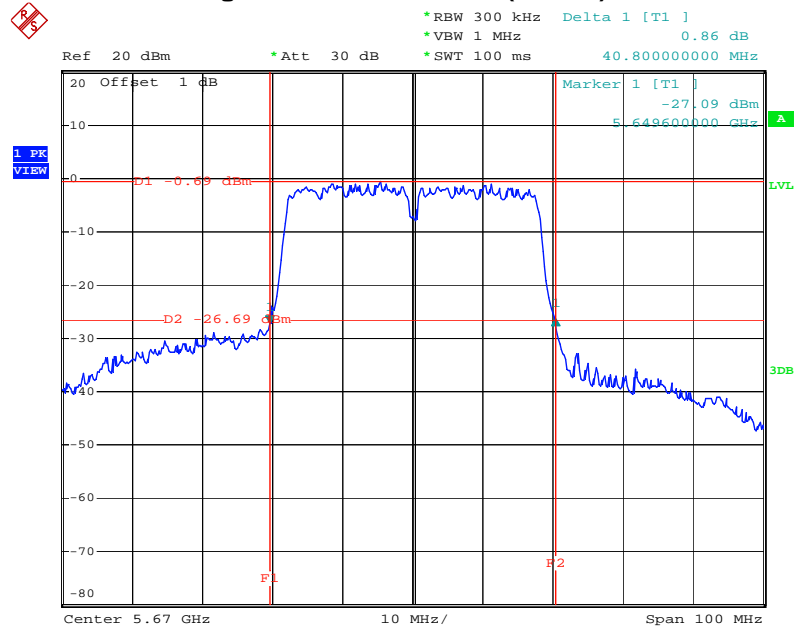
Date: 25.APR.2012 22:41:01

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 1



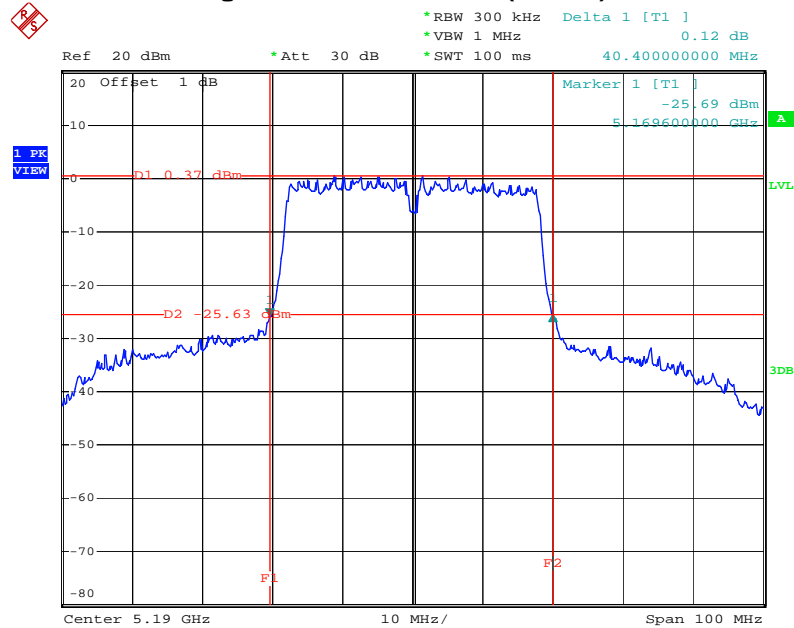
Date: 25.APR.2012 22:45:34

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 1



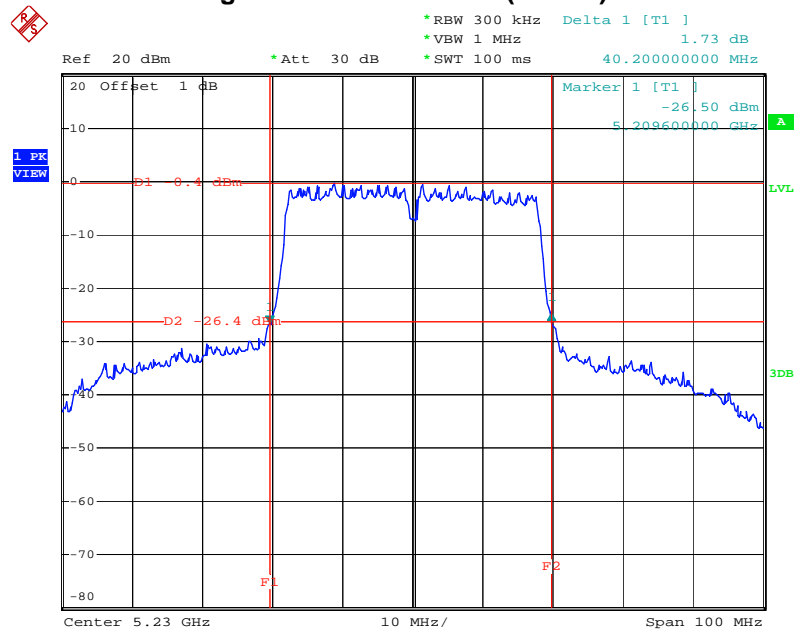
Date: 25.APR.2012 22:47:20

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 2



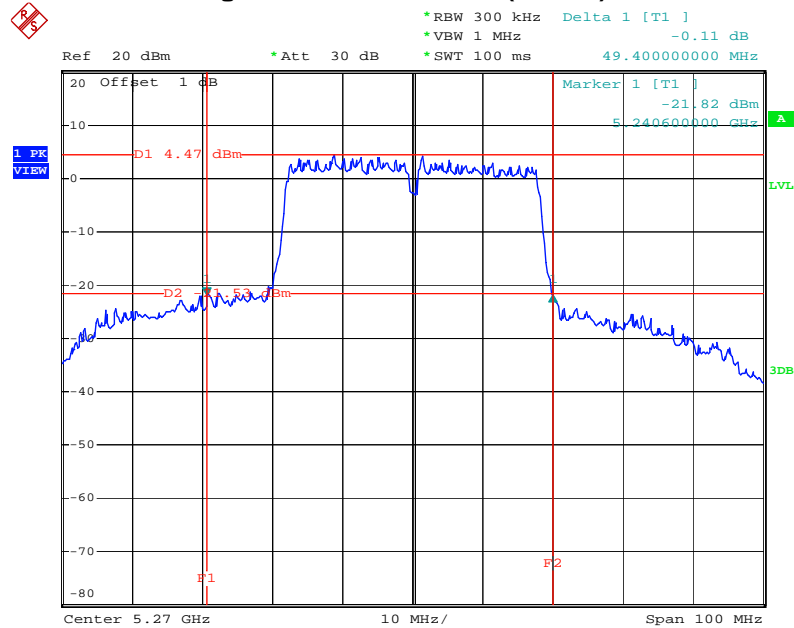
Date: 25.APR.2012 23:15:44

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 2



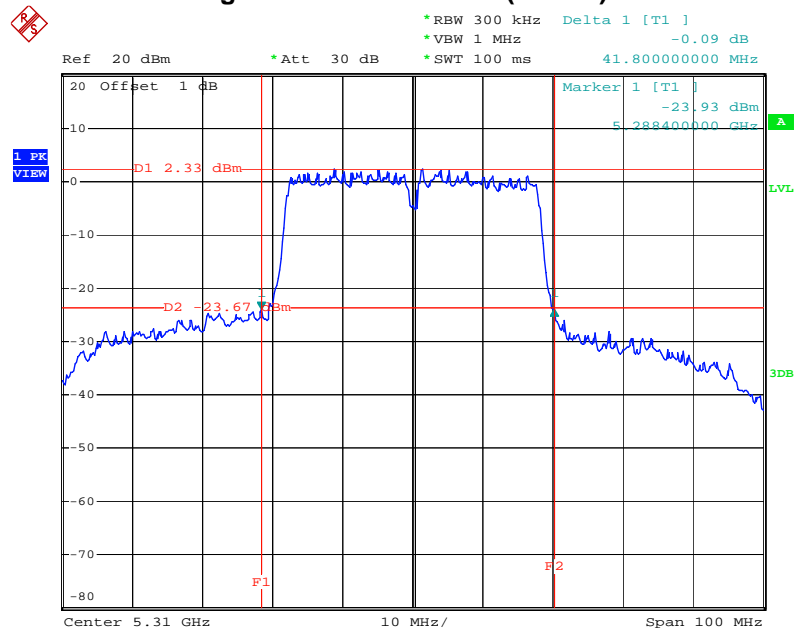
Date: 25.APR.2012 23:17:52

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 2



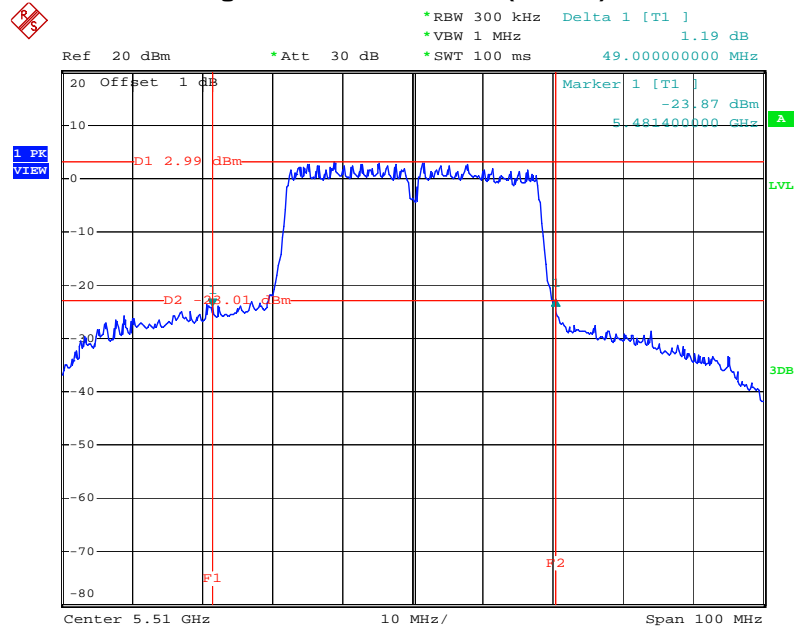
Date: 25.APR.2012 23:19:57

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 2



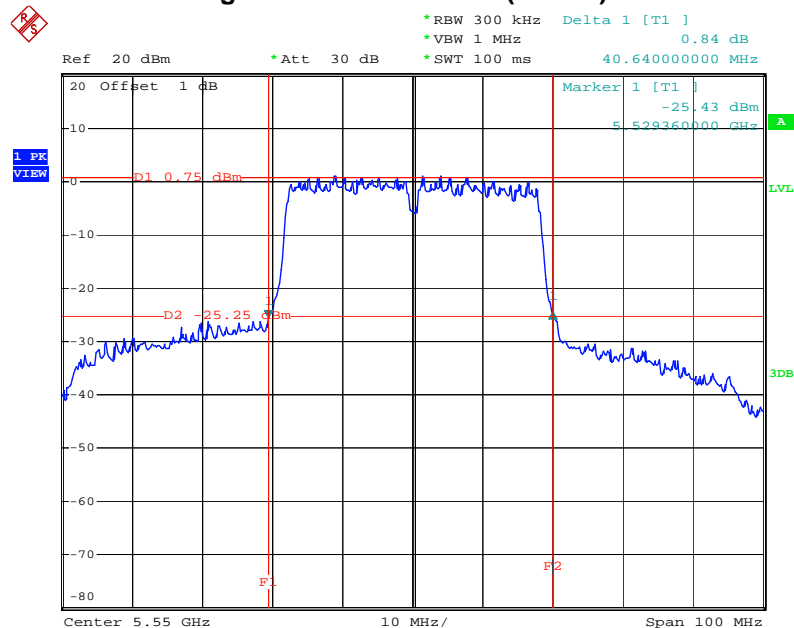
Date: 25.APR.2012 23:22:03

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 2



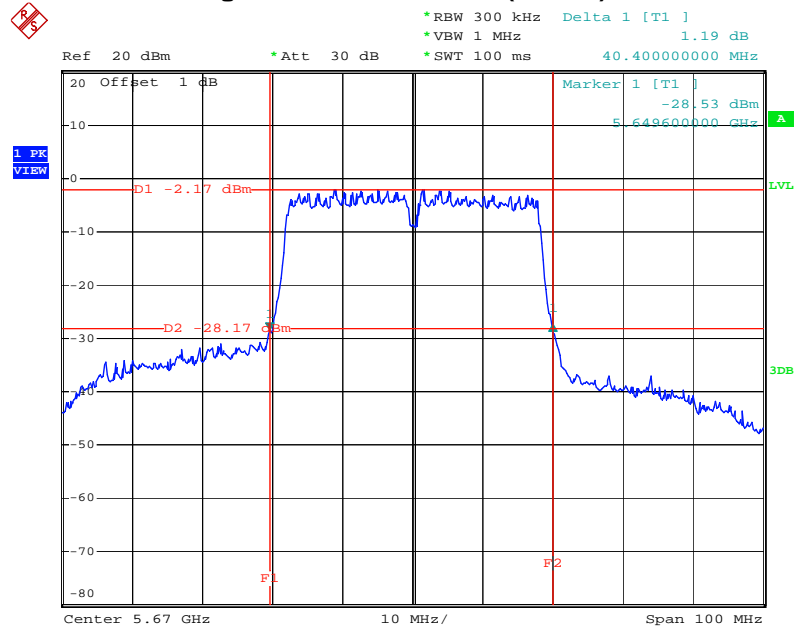
Date: 25.APR.2012 23:24:08

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 2



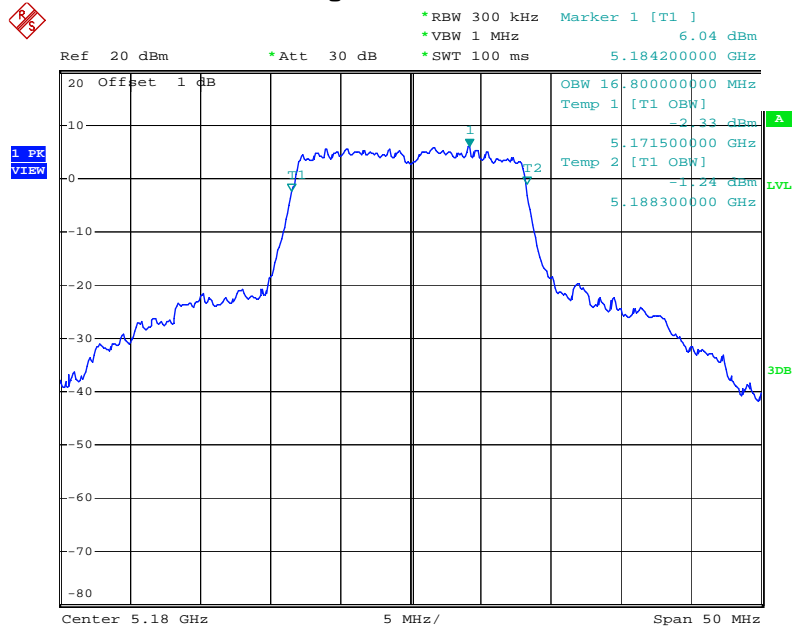
Date: 25.APR.2012 23:25:59

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 2



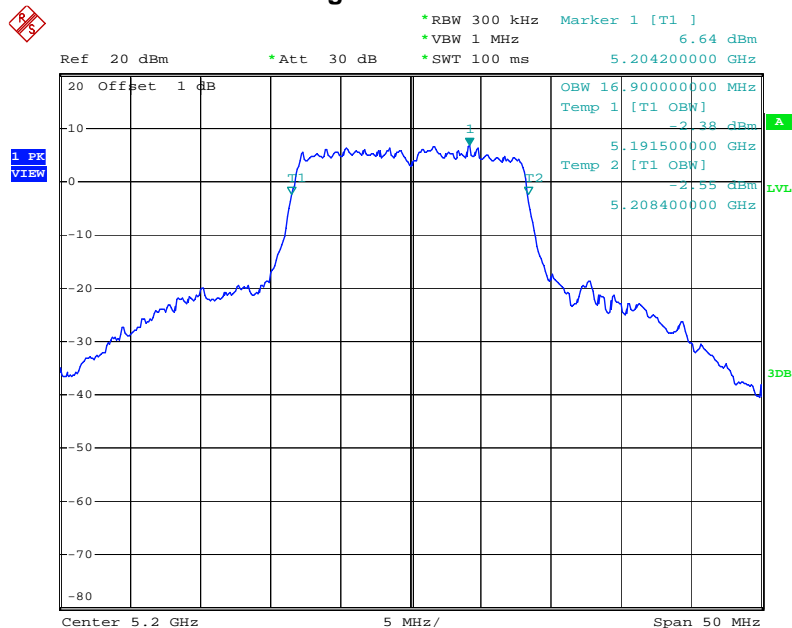
Date: 25.APR.2012 23:28:07

For Single Chain:
99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5180 MHz Port 2



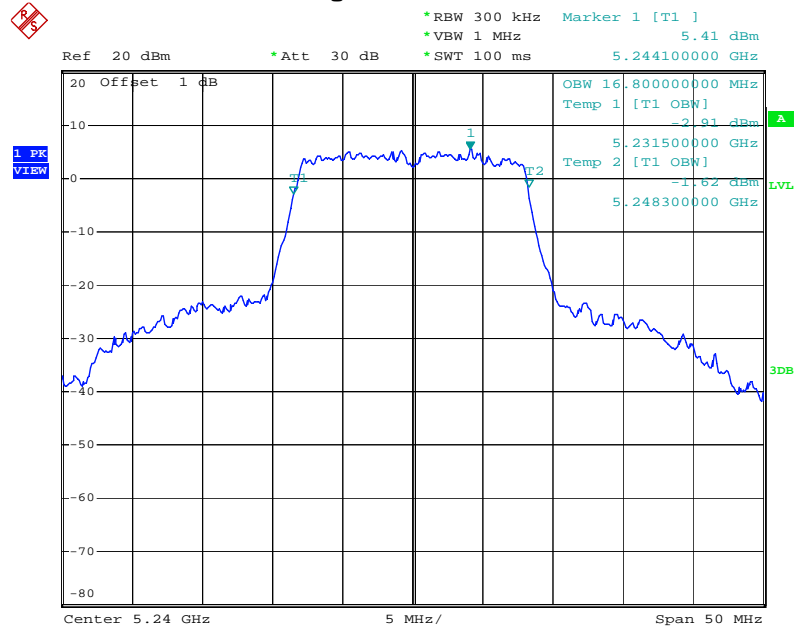
Date: 25.APR.2012 11:53:35

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5200 MHz Port 2



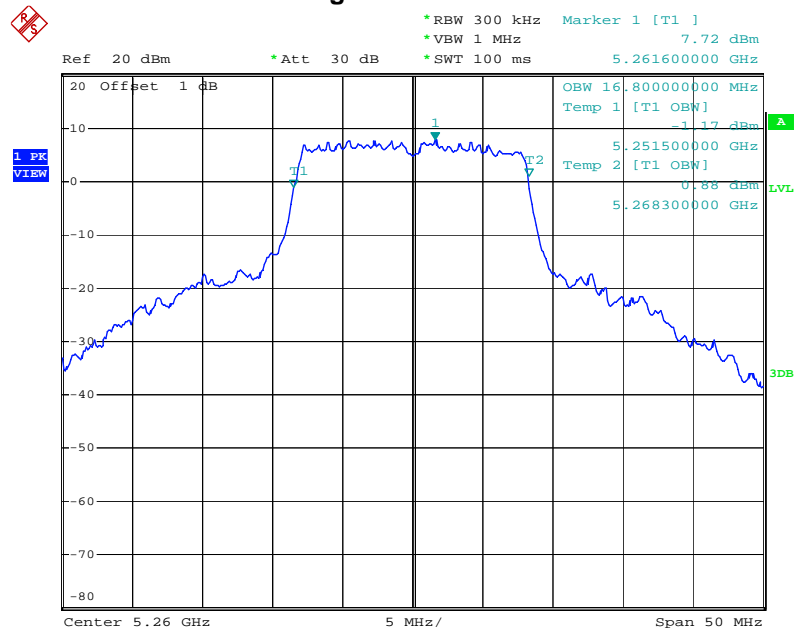
Date: 25.APR.2012 11:57:56

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5240 MHz Port 2



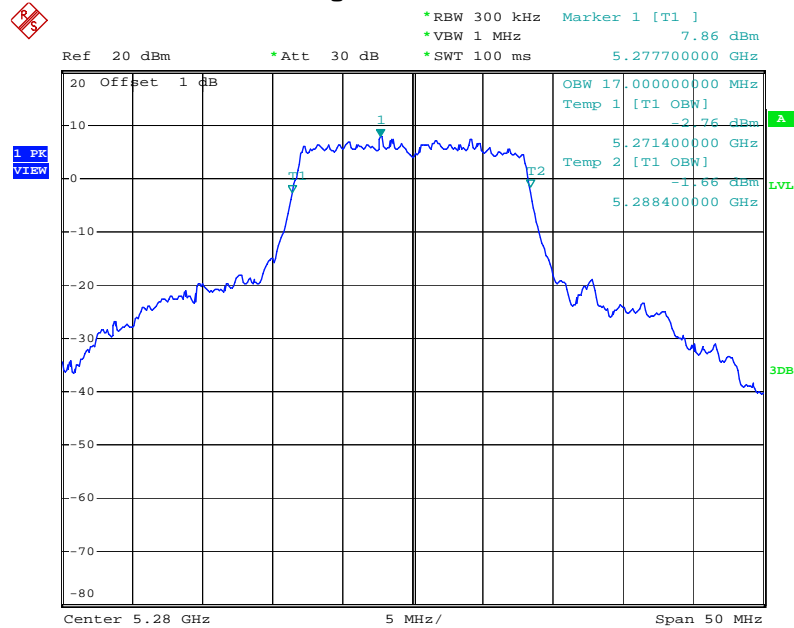
Date: 25.APR.2012 13:45:59

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5260 MHz Port 2



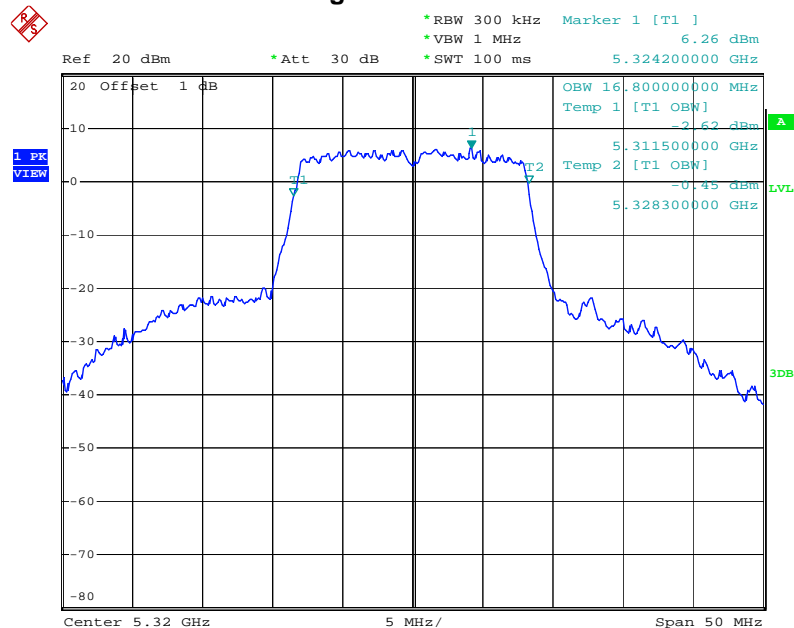
Date: 25.APR.2012 14:22:56

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5280 MHz Port 2



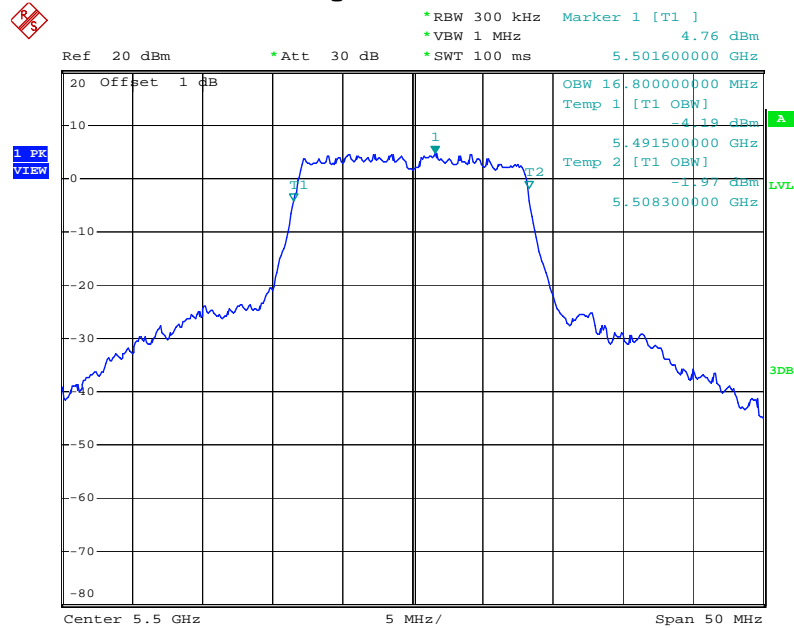
Date: 25.APR.2012 14:26:05

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5320 MHz Port 2



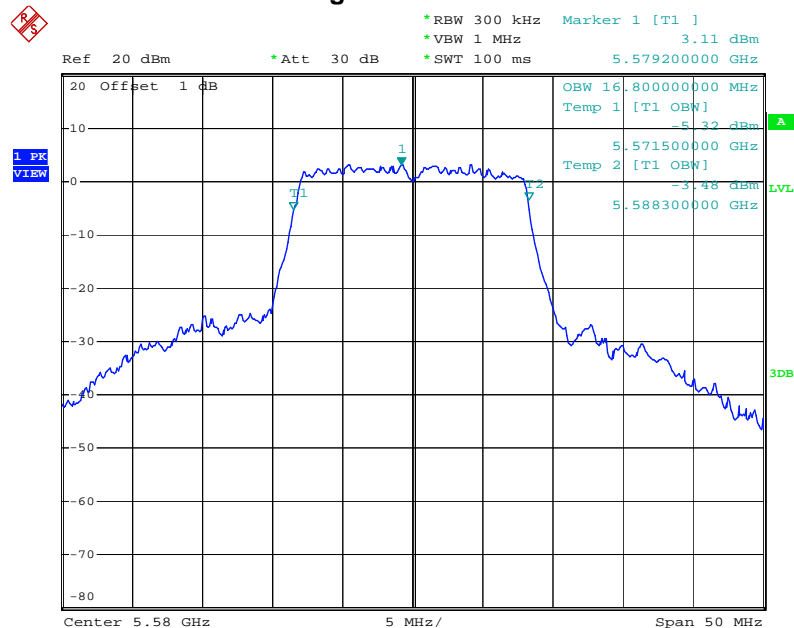
Date: 25.APR.2012 14:29:50

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5500 MHz Port 2



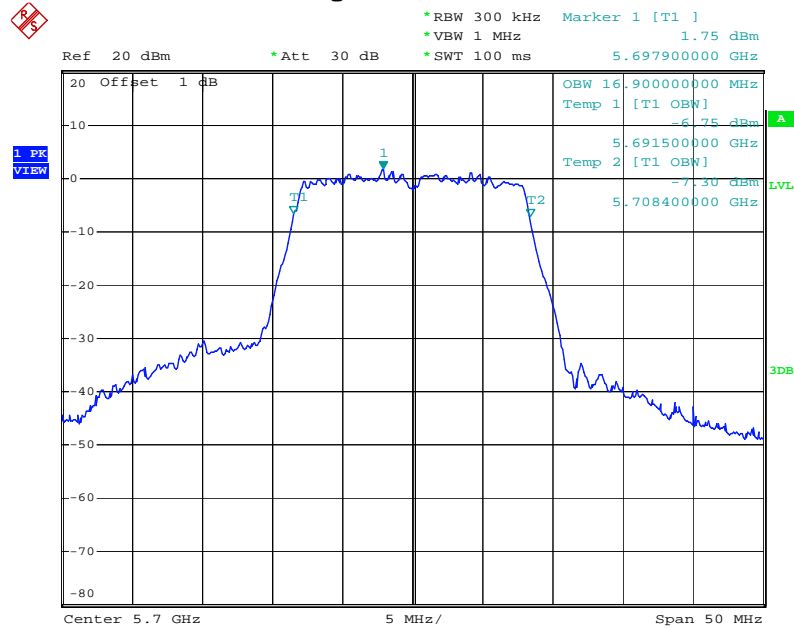
Date: 25.APR.2012 14:33:57

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5580 MHz Port 2



Date: 25.APR.2012 14:39:01

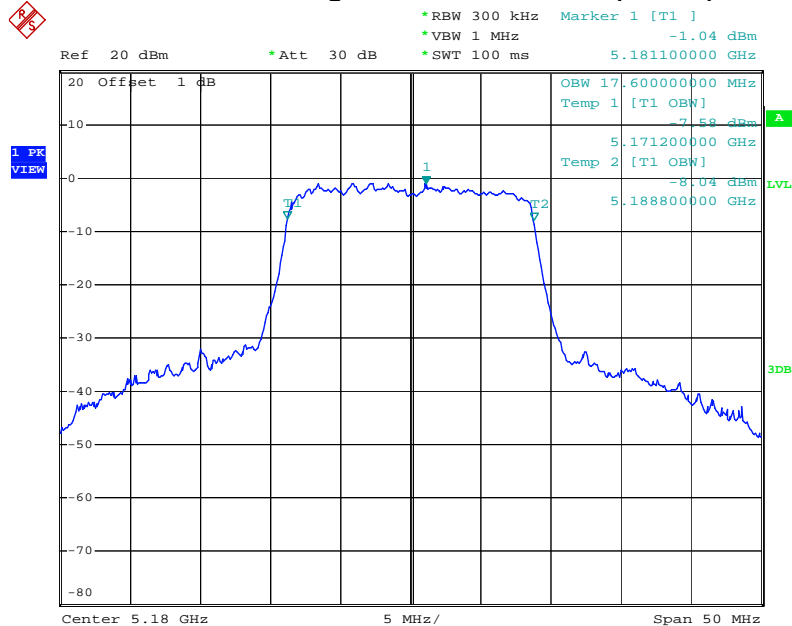
99% Occupied Bandwidth Plot on Configuration IEEE 802.11a 5700 MHz Port 2



Date: 25.APR.2012 14:41:37

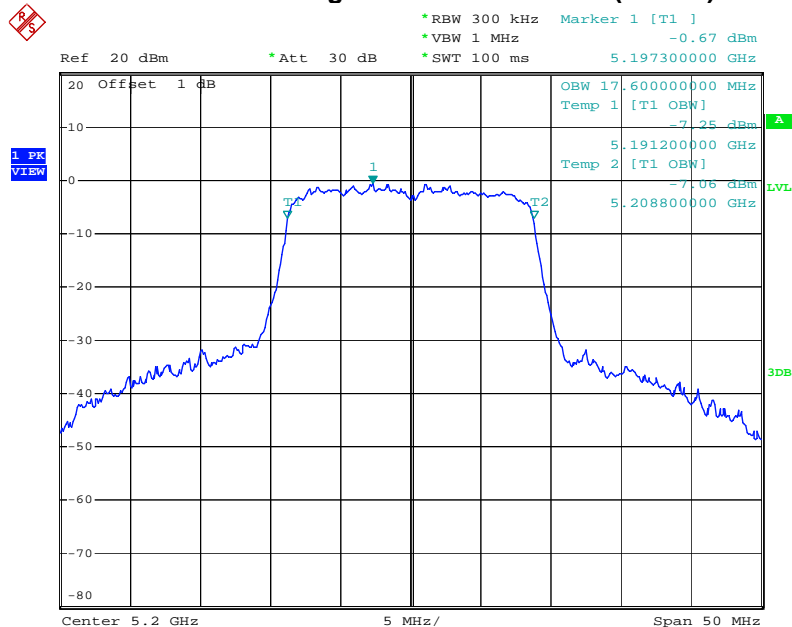
For Two Chains:

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 1



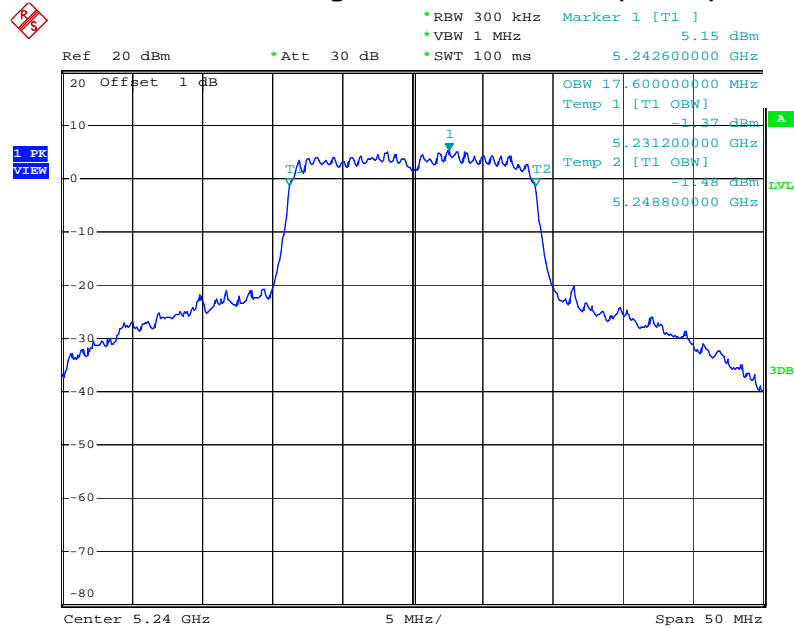
Date: 25.APR.2012 22:12:59

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 1



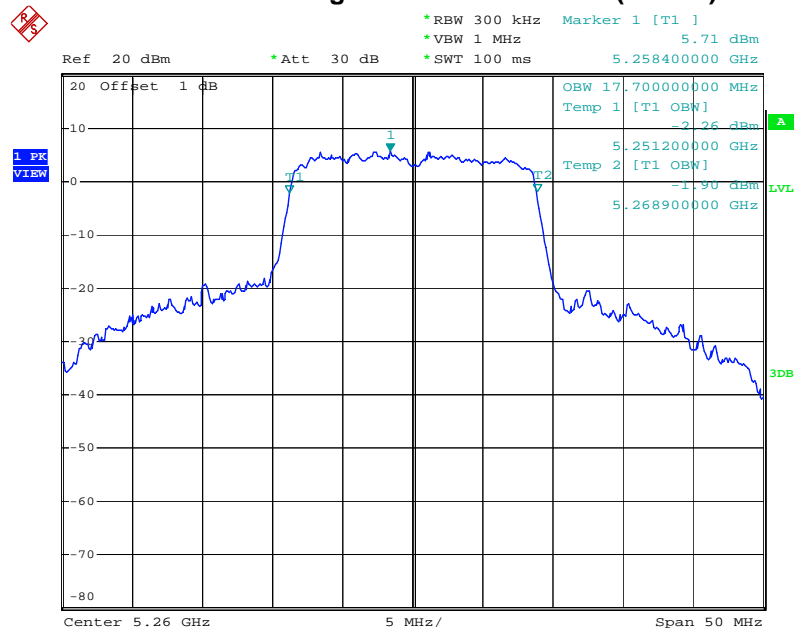
Date: 25.APR.2012 22:14:47

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 1



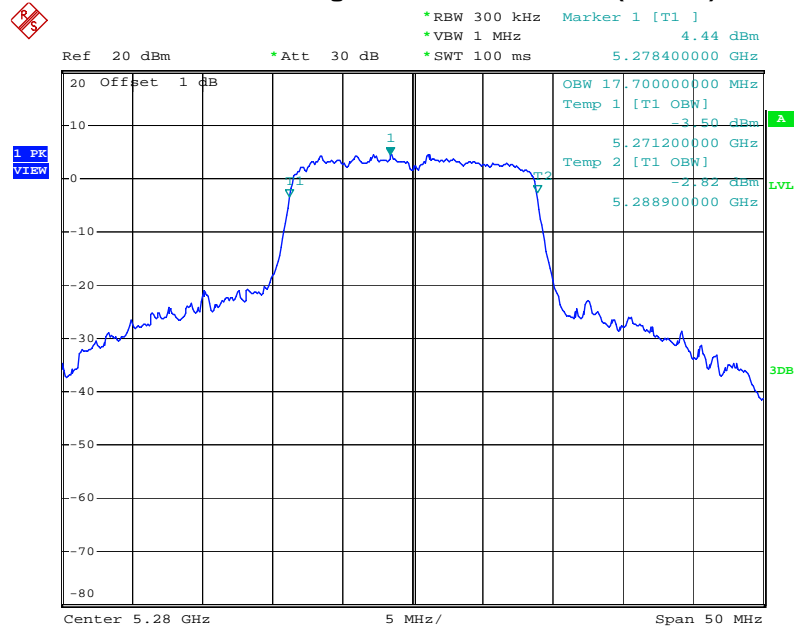
Date: 26.APR.2012 09:56:32

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 1



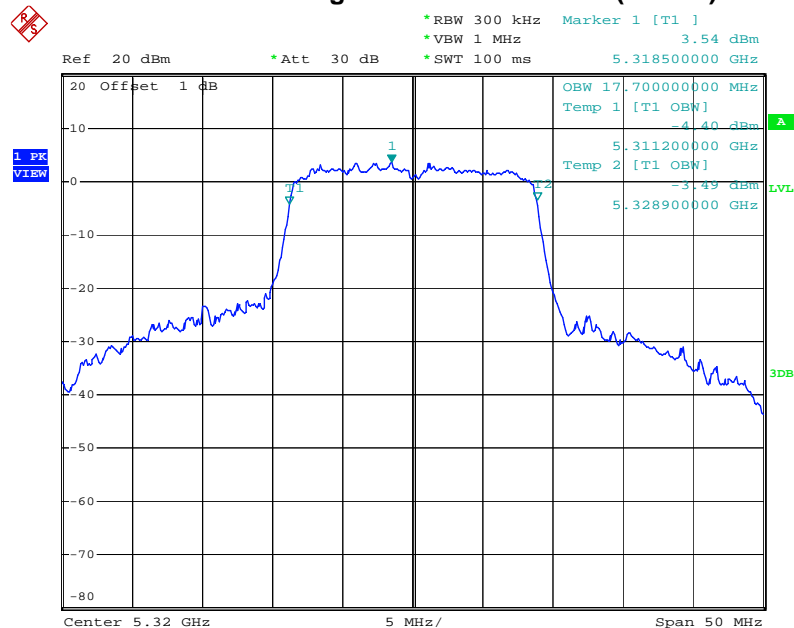
Date: 25.APR.2012 22:19:19

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 1



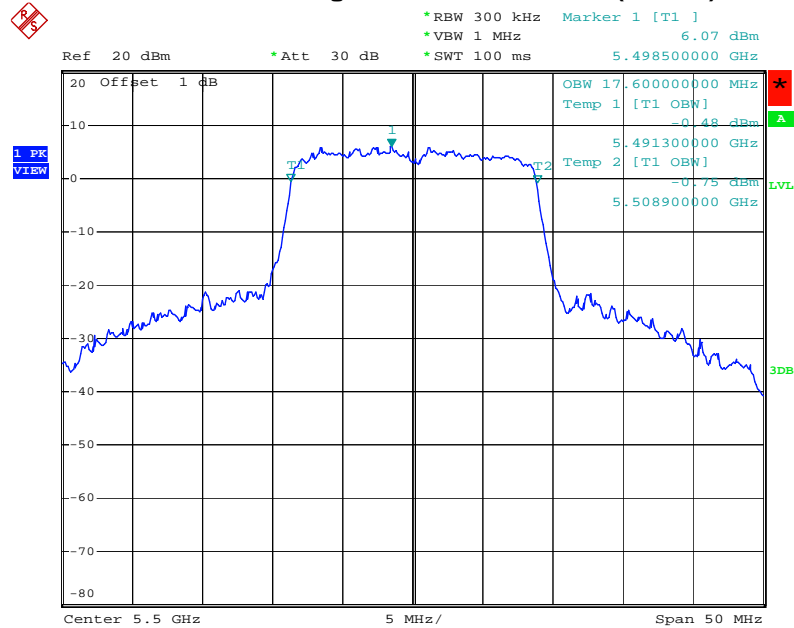
Date: 25.APR.2012 22:21:25

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 1



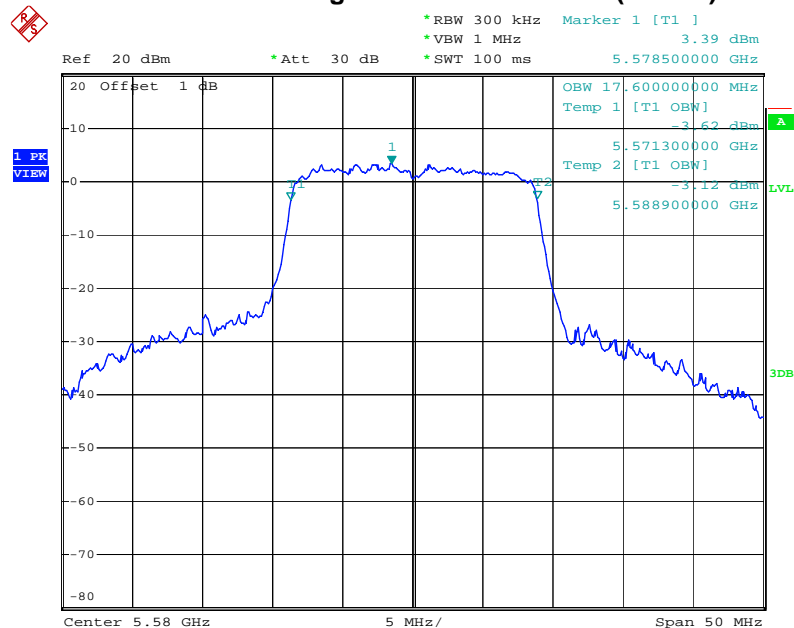
Date: 25.APR.2012 22:23:42

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 1



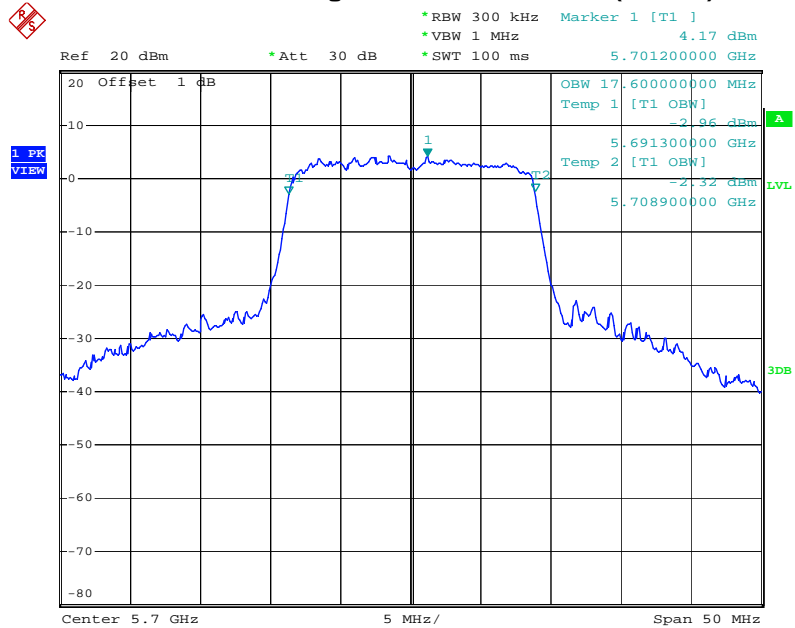
Date: 25.APR.2012 22:25:37

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 1



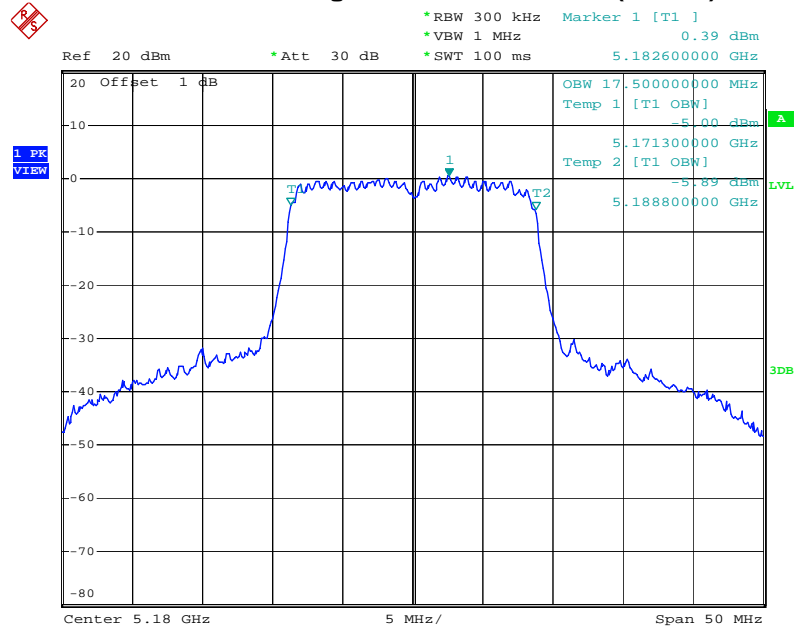
Date: 25.APR.2012 22:27:47

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 1



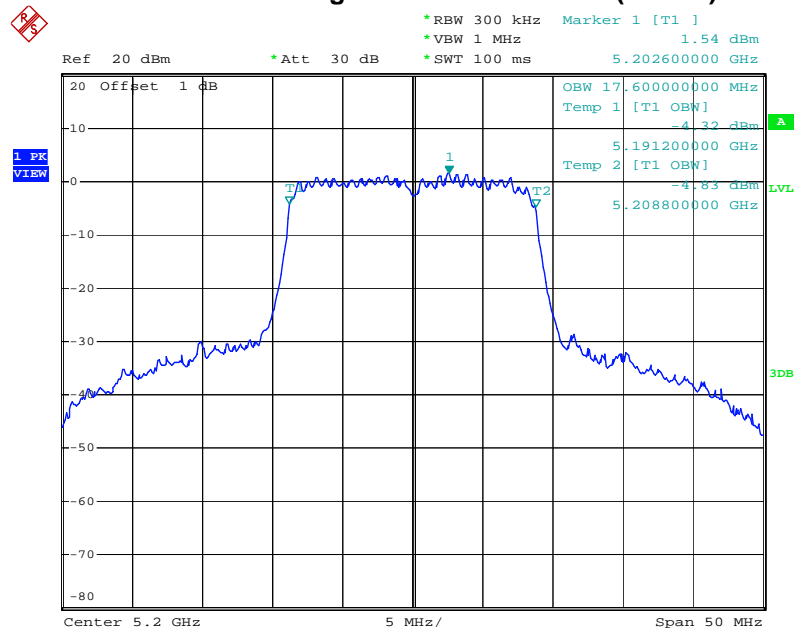
Date: 25.APR.2012 22:29:50

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 2



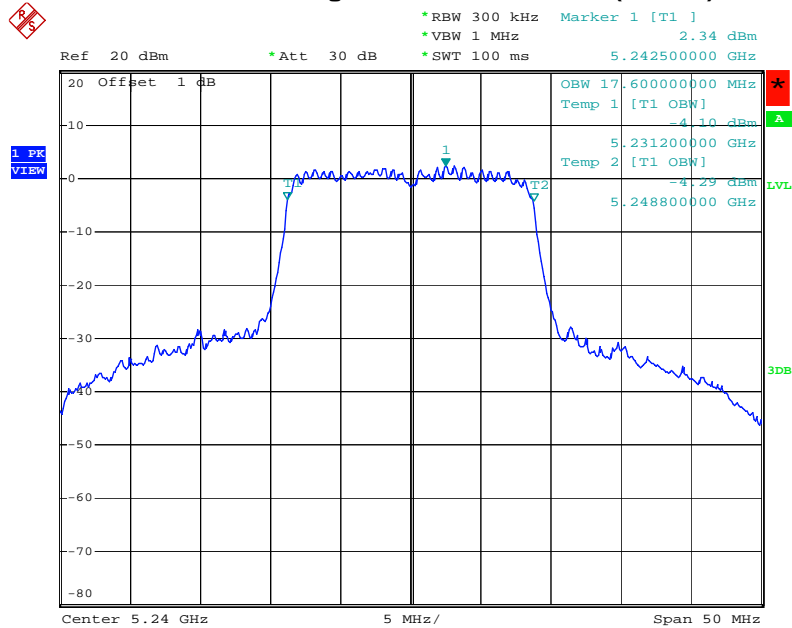
Date: 25.APR.2012 22:52:35

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 2



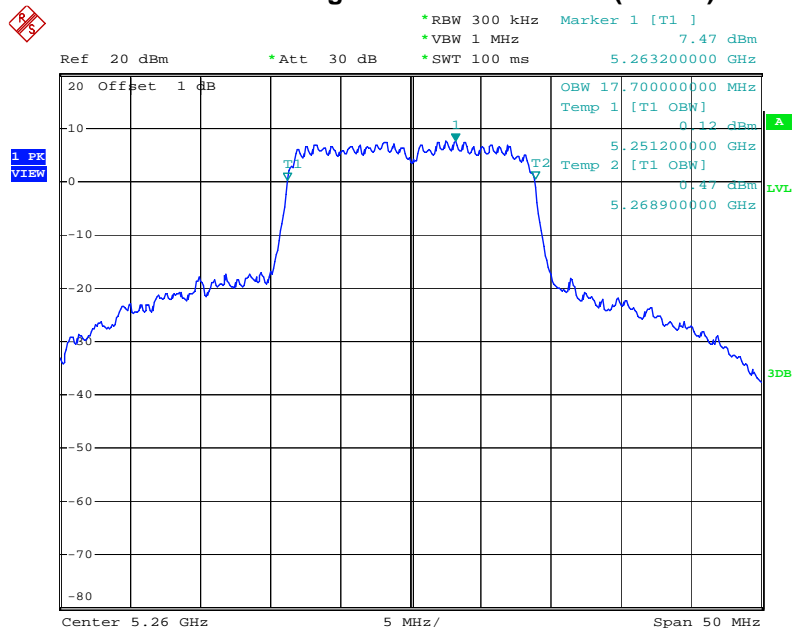
Date: 25.APR.2012 22:54:48

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 2



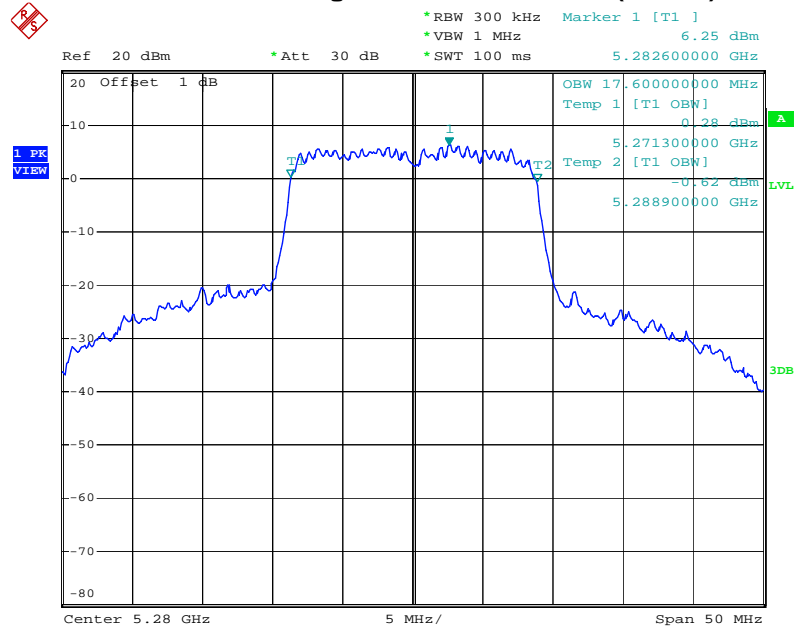
Date: 25.APR.2012 22:58:57

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 2



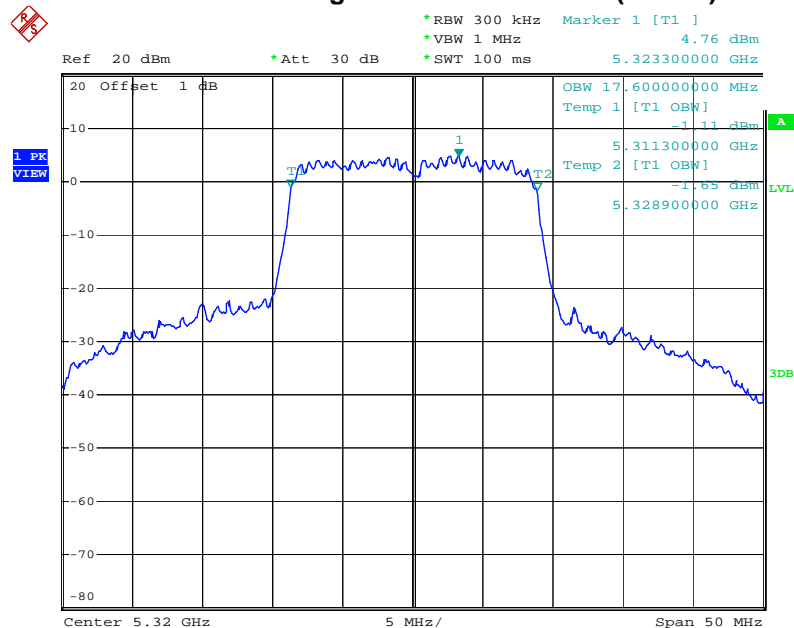
Date: 25.APR.2012 23:01:14

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 2



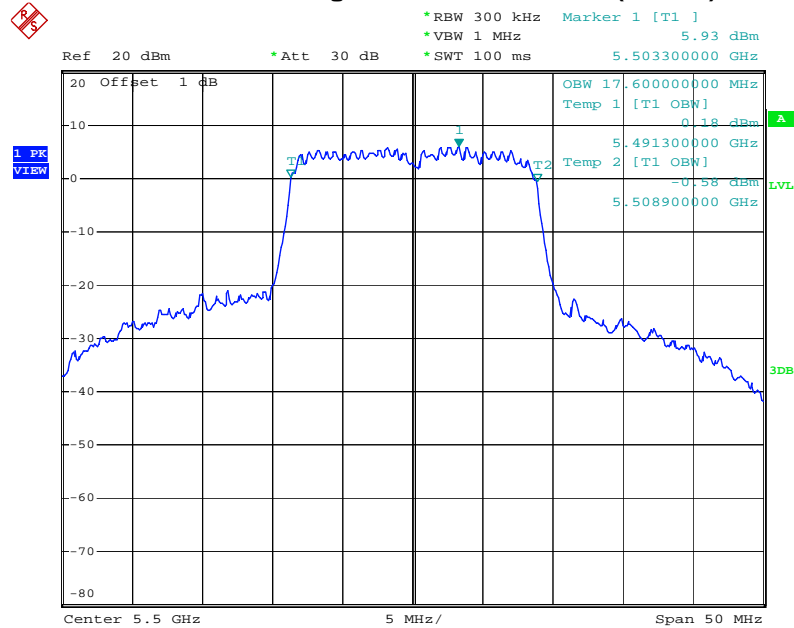
Date: 25.APR.2012 23:03:52

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 2



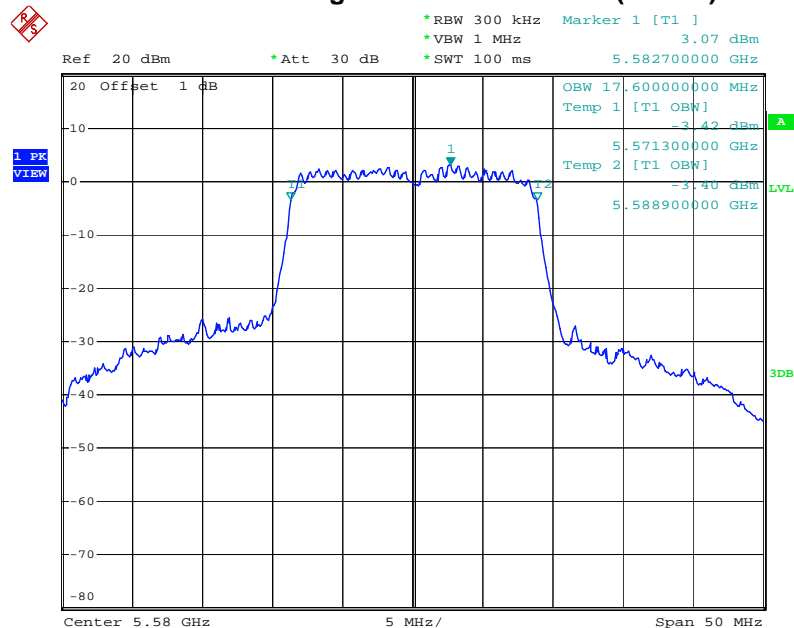
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 2



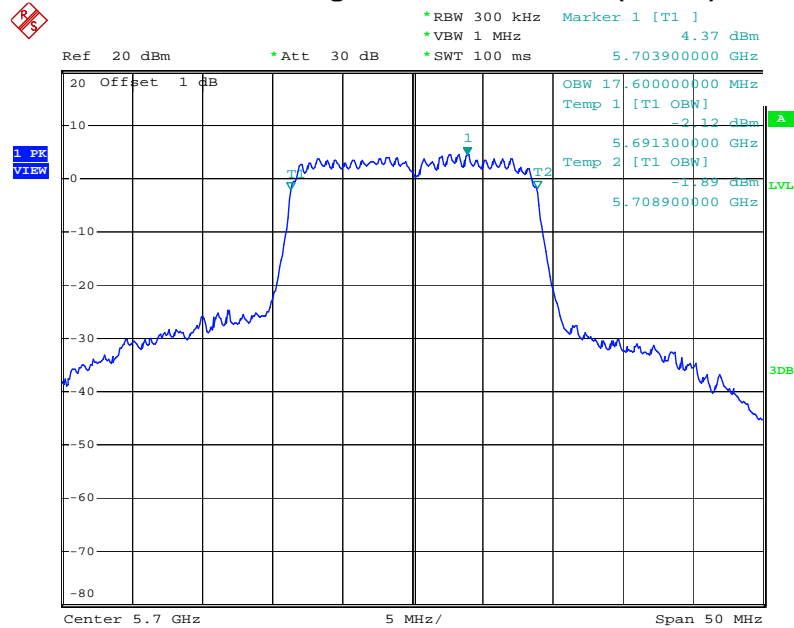
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 2



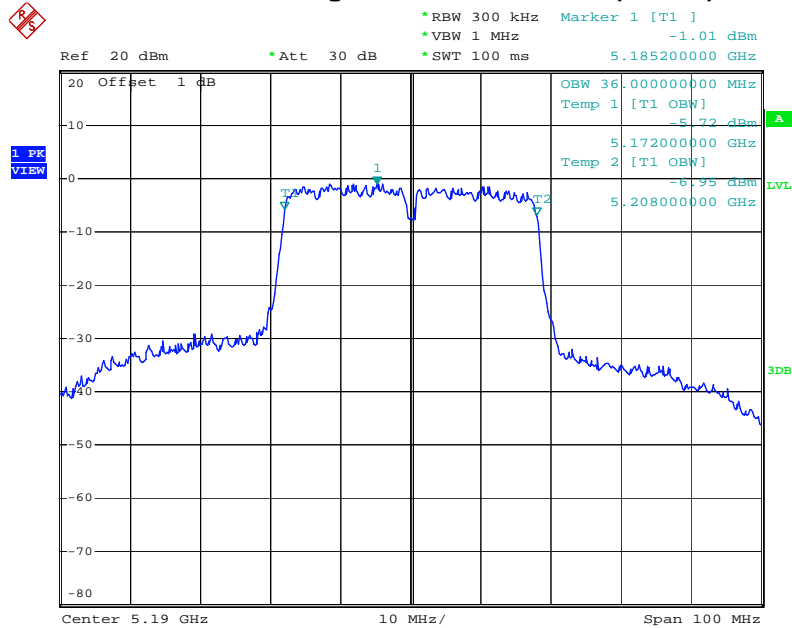
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 2



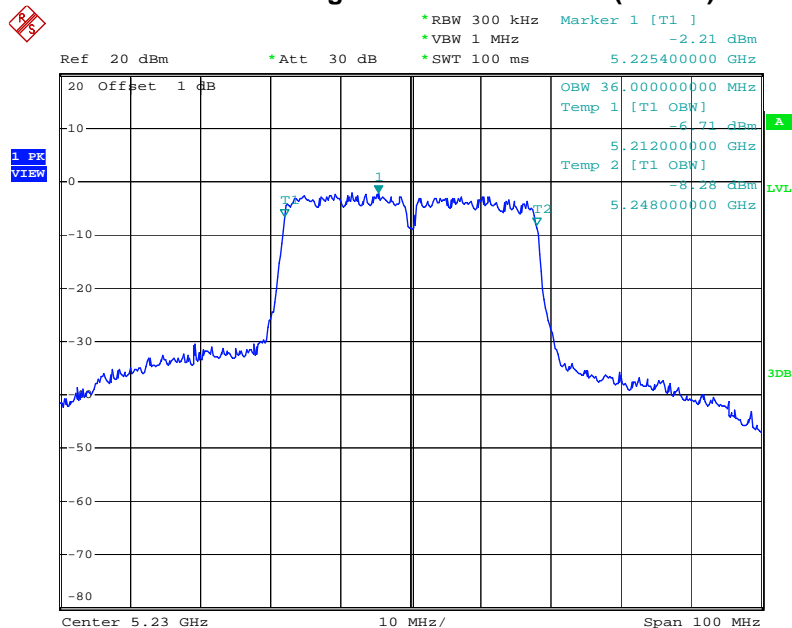
Date: 25.APR.2012 23:13:18

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 1



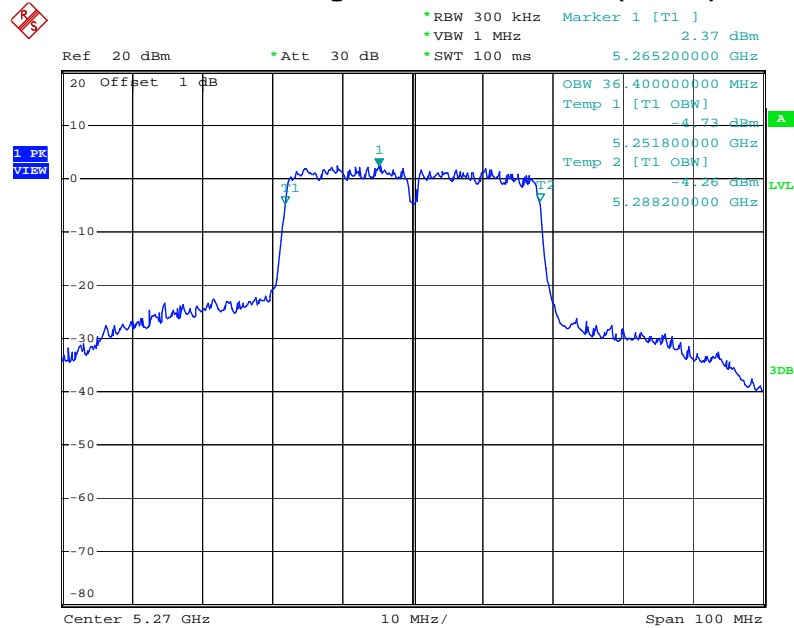
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 1



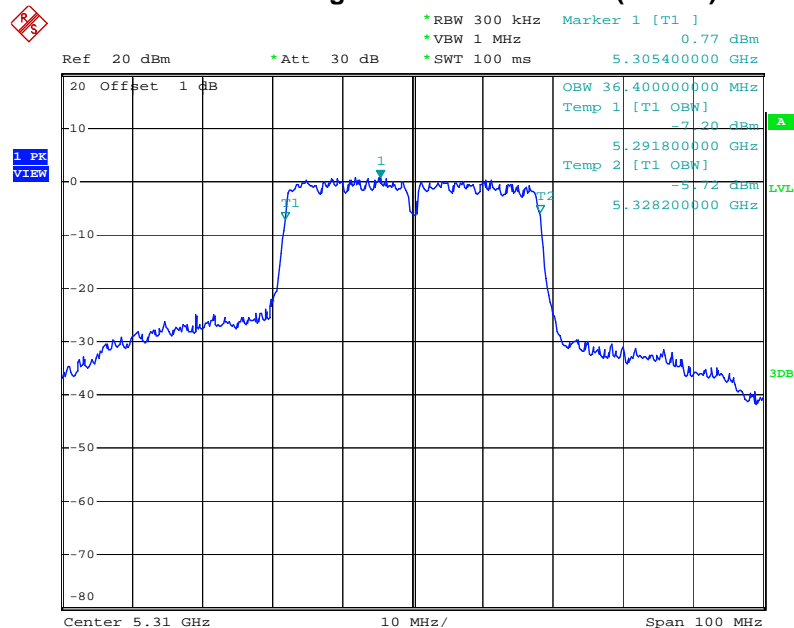
Date: 25.APR.2012 22:34:19

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 1



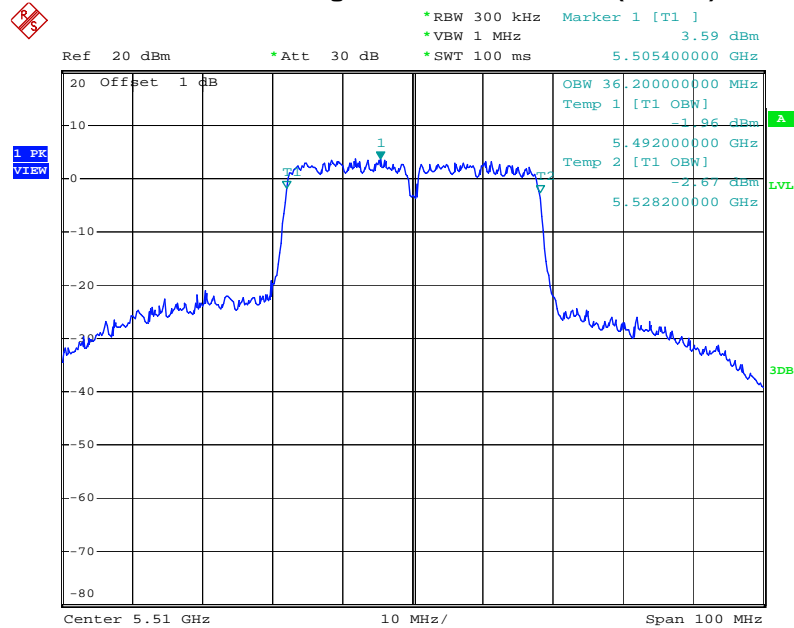
Date: 25.APR.2012 22:36:13

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 1



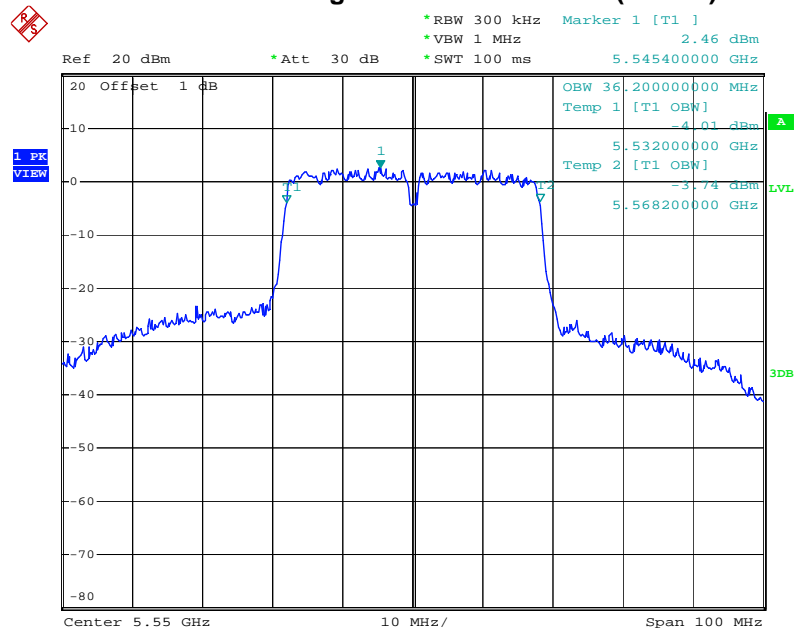
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 1



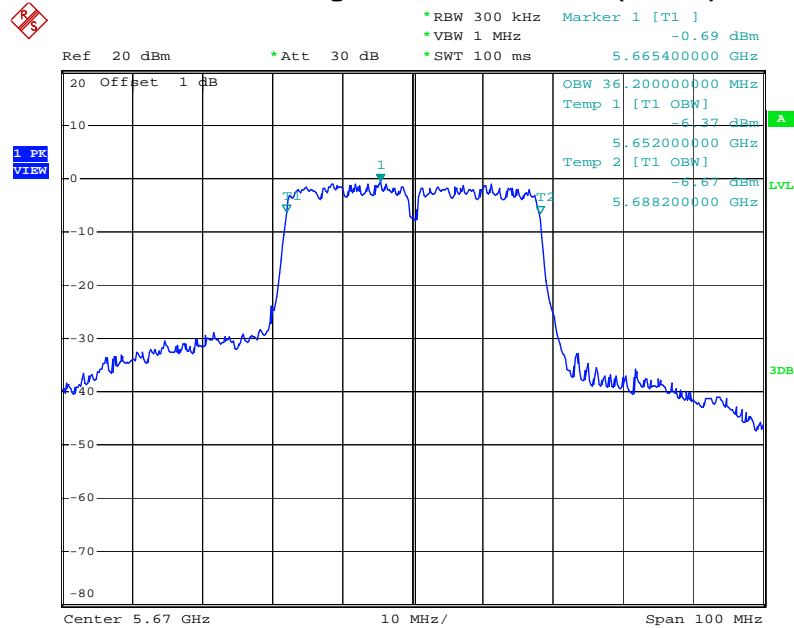
Date: 25.APR.2012 22:41:12

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 1



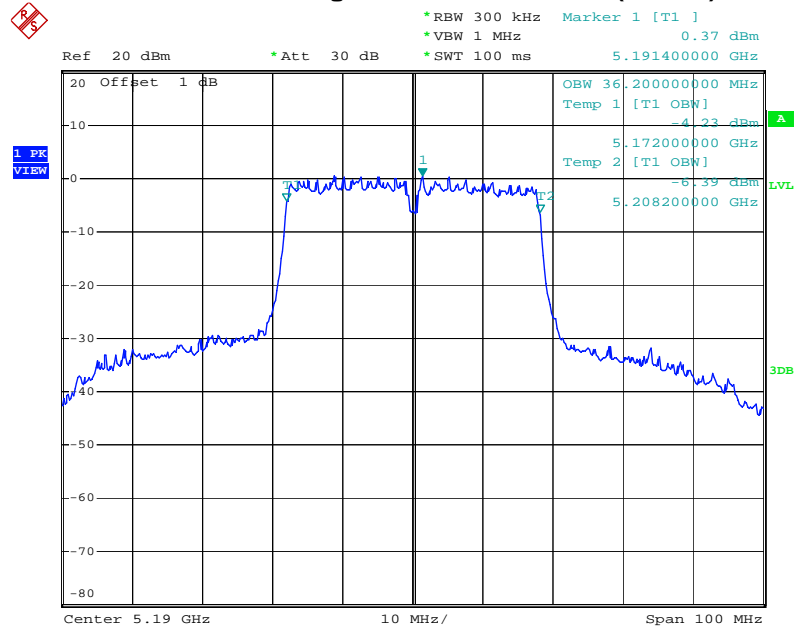
Date: 25.APR.2012 22:45:43

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 1



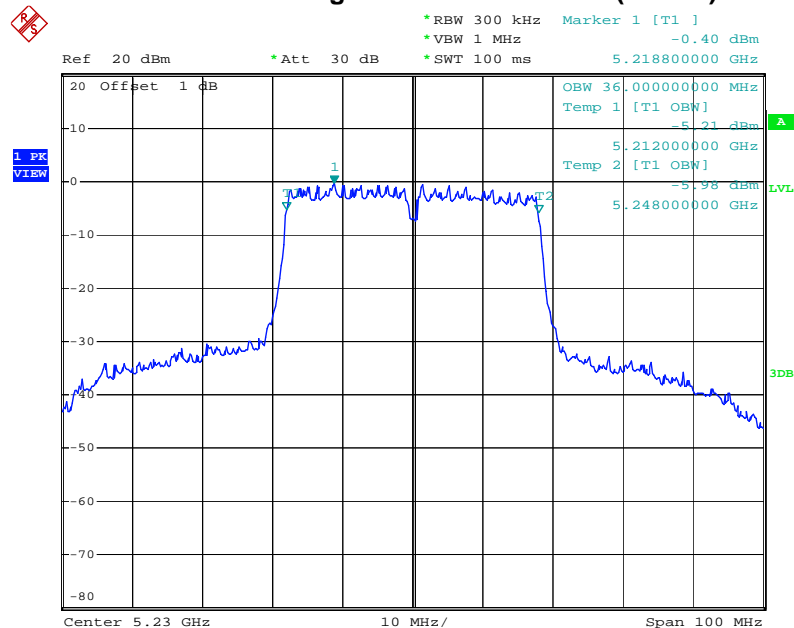
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 2



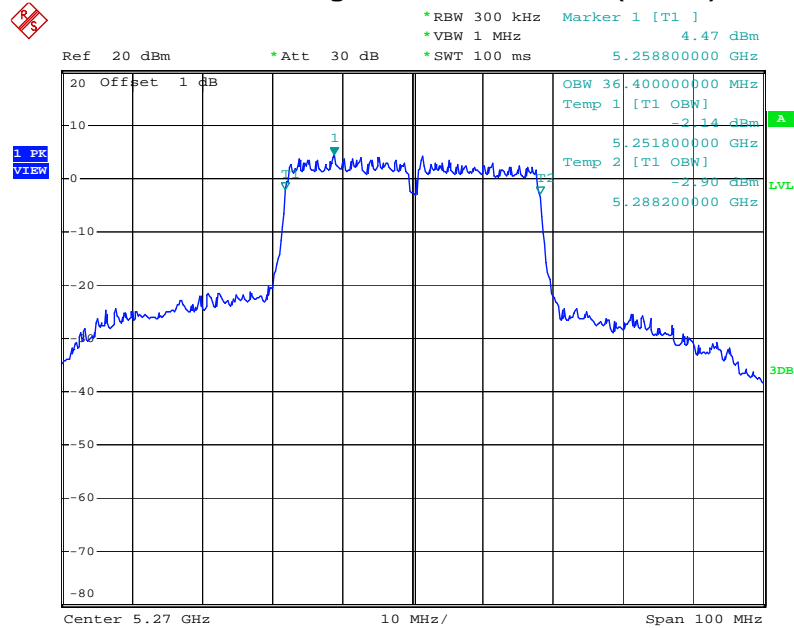
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 2



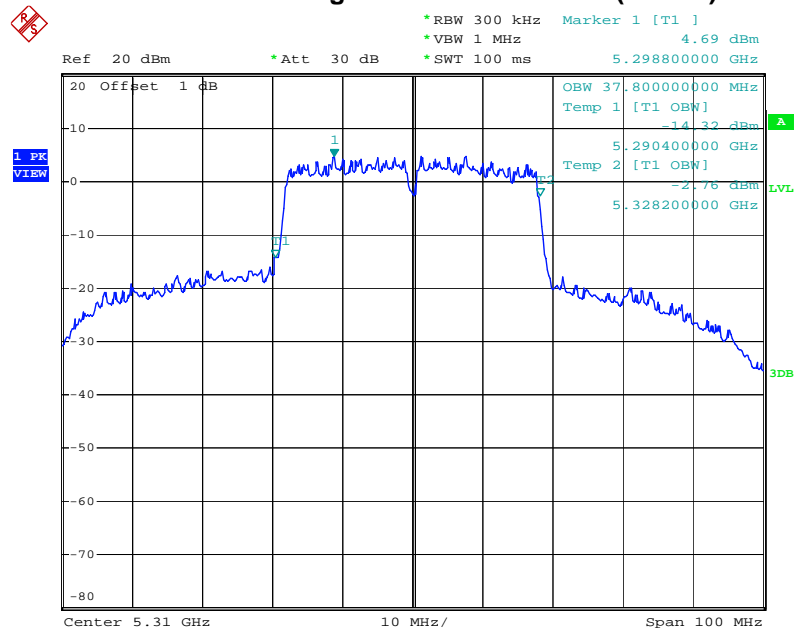
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 2



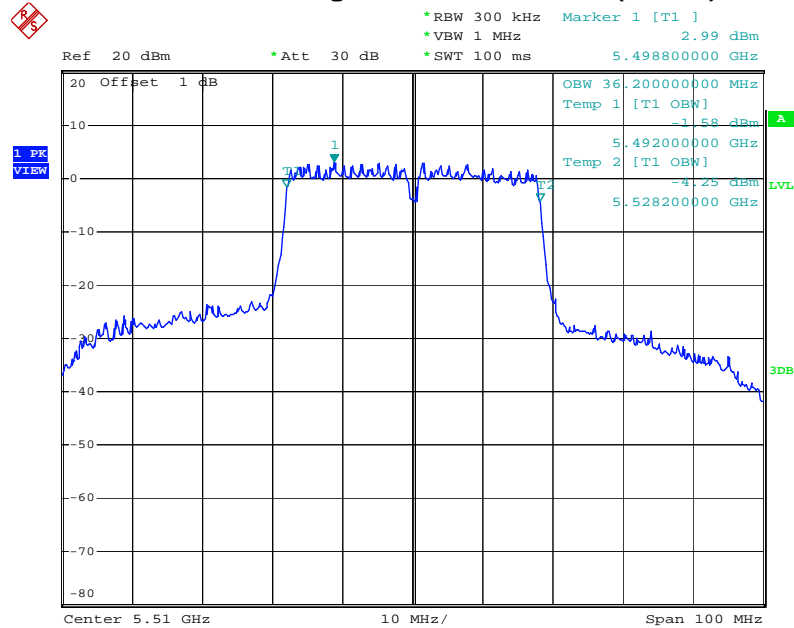
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 2



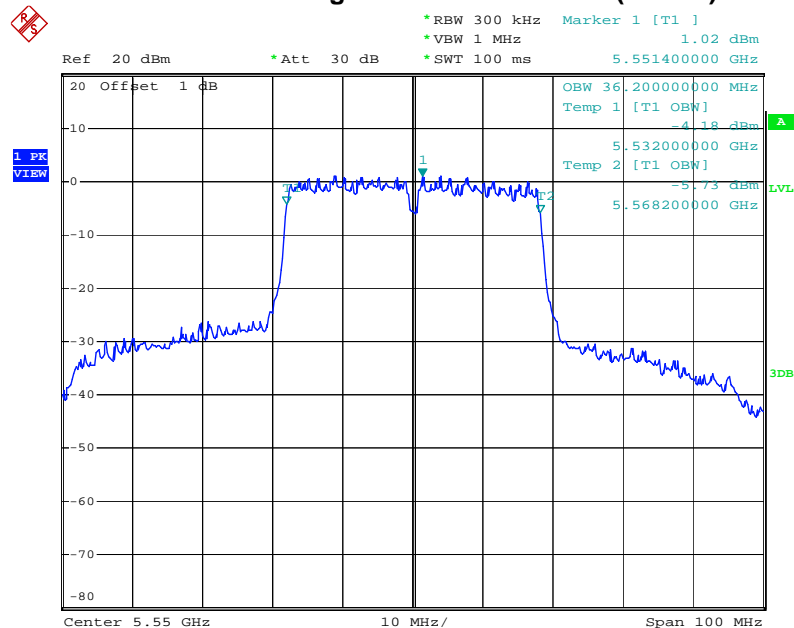
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99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 2



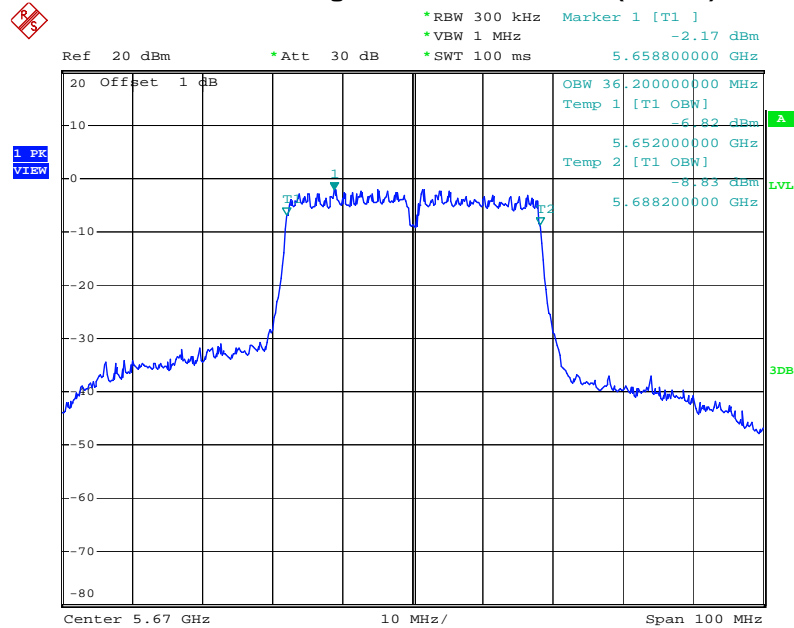
Date: 25.APR.2012 23:24:16

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 2



Date: 25.APR.2012 23:26:12

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 2



Date: 25.APR.2012 23:28:19

3.3 Maximum Conducted Output Power Measurement

3.3.1 Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25~5.35 GHz and 5.47~5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log B$. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Maximum Conducted Output Power mean that the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level.

3.3.2 Measuring Instruments and Setting

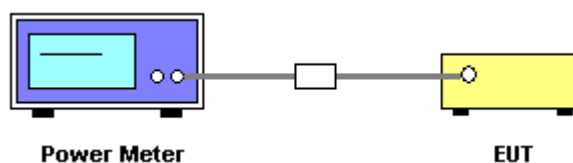
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Sensor	MA2411B

3.3.3 Test Procedures

1. The transmitter output (antenna port) was connected to the wideband power meter.
2. Turn on the EUT and power meter and then record the power value.
3. Repeat above procedures on all channels needed to be tested.
4. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula. (Only for IEEE 802.11n test)

3.3.4 Test Setup Layout



3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.3.7 Test Result of Maximum Conducted Output Power

Final Test Date	Apr. 25, 2012	Test Site No.	TH01-HY
Temperature	25.9℃	Humidity	30%
Test Engineer	Ian	Configurations	802.11a/n

For Single Chain:**Configuration of IEEE 802.11a Port 2**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	12.94	16.36	Complies
40	5200 MHz	13.02	16.36	Complies
48	5240 MHz	12.68	16.36	Complies
52	5260 MHz	17.19	23.36	Complies
56	5280 MHz	17.21	23.36	Complies
64	5320 MHz	16.29	23.36	Complies
100	5500 MHz	13.57	23.36	Complies
116	5580 MHz	13.68	23.36	Complies
140	5700 MHz	10.67	23.36	Complies

For Two Chains:**Configuration IEEE 802.11n (20MHz) Port 1**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	8.51	16.36	Complies
40	5200 MHz	8.97	16.36	Complies
48	5240 MHz	8.64	16.36	Complies
52	5260 MHz	16.34	23.36	Complies
56	5280 MHz	15.59	23.36	Complies
64	5320 MHz	13.57	23.36	Complies
100	5500 MHz	15.69	23.36	Complies
116	5580 MHz	15.64	23.36	Complies
140	5700 MHz	15.19	23.36	Complies

Configuration IEEE 802.11n (20MHz) Port 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	9.75	16.36	Complies
40	5200 MHz	10.01	16.36	Complies
48	5240 MHz	9.99	16.36	Complies
52	5260 MHz	17.23	23.36	Complies
56	5280 MHz	16.91	23.36	Complies
64	5320 MHz	14.89	23.36	Complies
100	5500 MHz	16.61	23.36	Complies
116	5580 MHz	16.43	23.36	Complies
140	5700 MHz	16.01	23.36	Complies

Configuration IEEE 802.11n (20MHz) Port 1+ Port 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	12.18	16.36	Complies
40	5200 MHz	12.53	16.36	Complies
48	5240 MHz	12.38	16.36	Complies
52	5260 MHz	19.82	23.36	Complies
56	5280 MHz	19.31	23.36	Complies
64	5320 MHz	17.29	23.36	Complies
100	5500 MHz	19.18	23.36	Complies
116	5580 MHz	19.06	23.36	Complies
140	5700 MHz	18.63	23.36	Complies

Configuration IEEE 802.11n (40MHz) Port 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	12.68	16.36	Complies
46	5230 MHz	11.65	16.36	Complies
54	5270 MHz	15.39	23.36	Complies
62	5310 MHz	14.57	23.36	Complies
102	5510 MHz	15.64	23.36	Complies
110	5550 MHz	15.58	23.36	Complies
134	5670 MHz	13.35	23.36	Complies

Configuration IEEE 802.11n (40MHz) Port 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	12.46	16.36	Complies
46	5230 MHz	11.46	16.36	Complies
54	5270 MHz	15.24	23.36	Complies
62	5310 MHz	14.38	23.36	Complies
102	5510 MHz	15.42	23.36	Complies
110	5550 MHz	15.26	23.36	Complies
134	5670 MHz	13.19	23.36	Complies

Configuration IEEE 802.11n (40MHz) Port 1+ Port 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	15.58	16.36	Complies
46	5230 MHz	14.57	16.36	Complies
54	5270 MHz	18.33	23.36	Complies
62	5310 MHz	17.49	23.36	Complies
102	5510 MHz	18.54	23.36	Complies
110	5550 MHz	18.43	23.36	Complies
134	5670 MHz	16.28	23.36	Complies

3.4 Power Spectral Density Measurement

3.4.1 Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 3.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25~5.35 GHz	11
5.47~5.725 GHz	11

3.4.2 Measuring Instruments and Setting

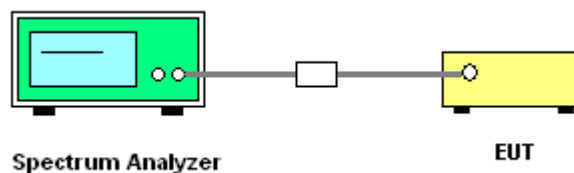
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

3.4.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz. Set Detector to Peak, Trace to Max Hold. Mark the frequency with maximum peak power as the center of the display of the spectrum.
3. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula. (Only for IEEE 802.11n test)

3.4.4 Test Setup Layout



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.4.7 Test Result of Power Spectral Density

Final Test Date	Apr. 25, 2012	Test Site No.	TH01-HY
Temperature	25.9°C	Humidity	30%
Test Engineer	Ian	Configurations	802.11a/n

**For Single Chain:
Configuration of IEEE 802.11a Port 2**

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	3.12	3.36	Complies
5200 MHz	3.24	3.36	Complies
5240 MHz	3.23	3.36	Complies
5260 MHz	6.89	10.36	Complies
5280 MHz	5.18	10.36	Complies
5320 MHz	4.50	10.36	Complies
5500 MHz	3.21	10.36	Complies
5580 MHz	1.98	10.36	Complies
5700 MHz	-1.04	10.36	Complies

For Two Chains:**Configuration IEEE 802.11n (20MHz) Port 1**

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	-0.01	3.36	Complies
5200 MHz	0.26	3.36	Complies
5240 MHz	-1.59	3.36	Complies
5260 MHz	5.42	10.36	Complies
5280 MHz	5.93	10.36	Complies
5320 MHz	5.07	10.36	Complies
5500 MHz	6.71	10.36	Complies
5580 MHz	6.59	10.36	Complies
5700 MHz	5.96	10.36	Complies

Configuration IEEE 802.11n (20MHz) Port 2

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	0.63	3.36	Complies
5200 MHz	0.42	3.36	Complies
5240 MHz	0.21	3.36	Complies
5260 MHz	7.64	10.36	Complies
5280 MHz	6.90	10.36	Complies
5320 MHz	5.81	10.36	Complies
5500 MHz	5.60	10.36	Complies
5580 MHz	5.47	10.36	Complies
5700 MHz	5.13	10.36	Complies

Configuration IEEE 802.11n (20MHz) Port 1+ Port 2

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	3.33	3.36	Complies
5200 MHz	3.35	3.36	Complies
5240 MHz	2.41	3.36	Complies
5260 MHz	9.68	10.36	Complies
5280 MHz	9.45	10.36	Complies
5320 MHz	8.47	10.36	Complies
5500 MHz	9.20	10.36	Complies
5580 MHz	9.08	10.36	Complies
5700 MHz	8.58	10.36	Complies

Configuration IEEE 802.11n (40MHz) Port 1

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5190 MHz	0.75	3.36	Complies
5230 MHz	-0.45	3.36	Complies
5270 MHz	4.35	10.36	Complies
5310 MHz	2.05	10.36	Complies
5510 MHz	4.36	10.36	Complies
5550 MHz	3.66	10.36	Complies
5670 MHz	1.16	10.36	Complies

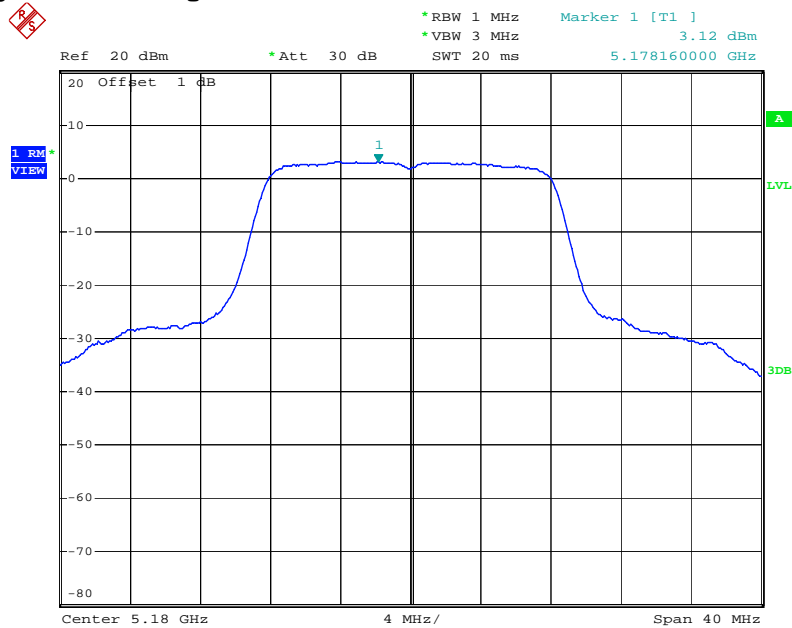
Configuration IEEE 802.11n (40MHz) Port 2

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5190 MHz	-0.41	3.36	Complies
5230 MHz	0.52	3.36	Complies
5270 MHz	5.07	10.36	Complies
5310 MHz	2.73	10.36	Complies
5510 MHz	3.71	10.36	Complies
5550 MHz	2.65	10.36	Complies
5670 MHz	-0.68	10.36	Complies

Configuration IEEE 802.11n (40MHz) Port 1+ Port 2

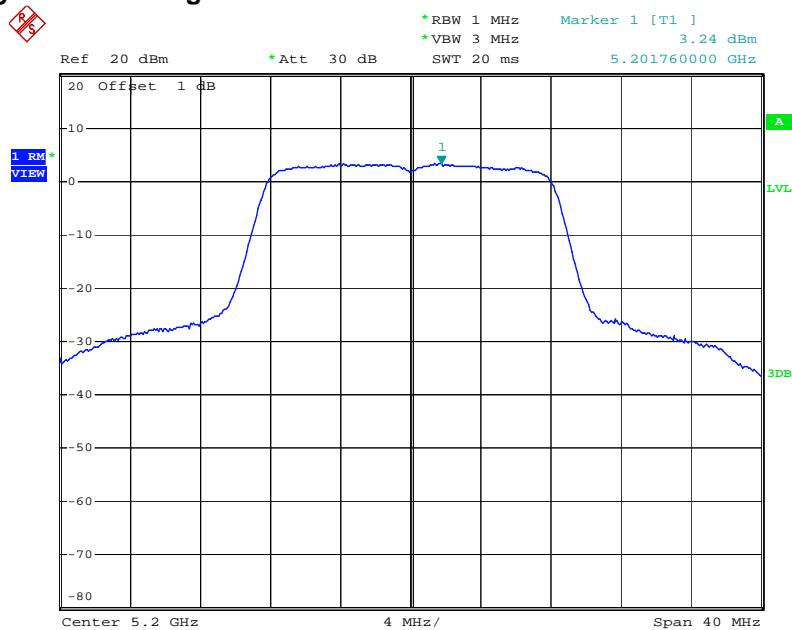
Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5190 MHz	3.22	3.36	Complies
5230 MHz	3.07	3.36	Complies
5270 MHz	7.74	10.36	Complies
5310 MHz	5.41	10.36	Complies
5510 MHz	7.06	10.36	Complies
5550 MHz	6.19	10.36	Complies
5670 MHz	3.35	10.36	Complies

For Single Chain:
Power Density Plot on Configuration IEEE 802.11a 5180 MHz Port 2



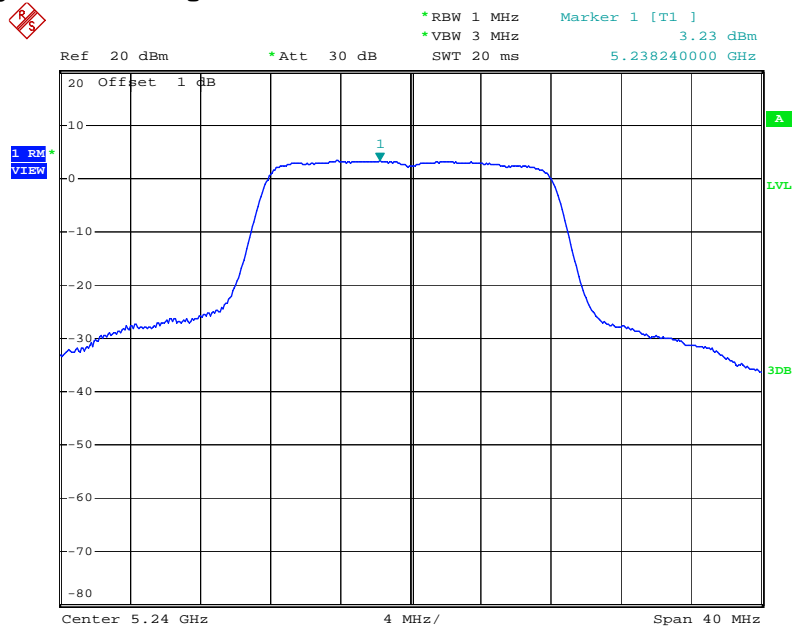
Date: 25.APR.2012 15:49:06

Power Density Plot on Configuration IEEE 802.11a 5200 MHz Port 2



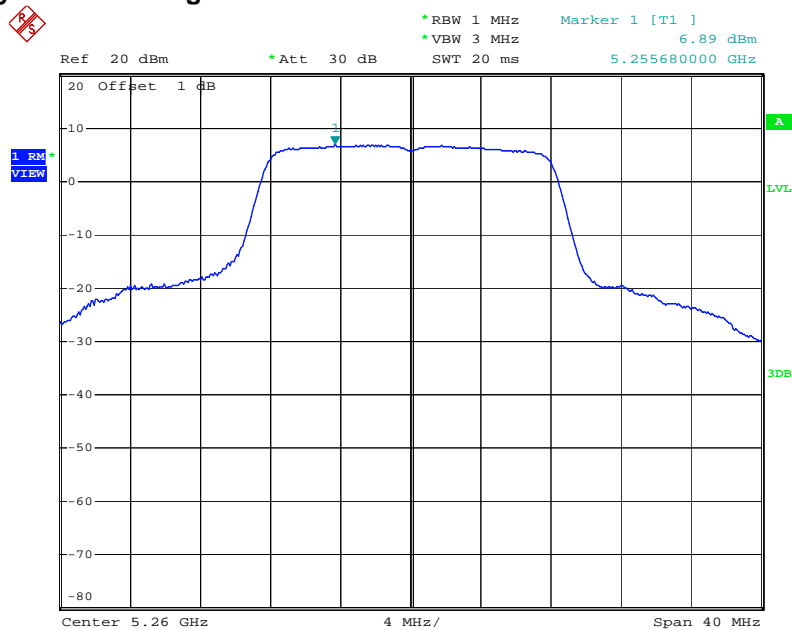
Date: 25.APR.2012 15:52:19

Power Density Plot on Configuration IEEE 802.11a 5240 MHz Port 2



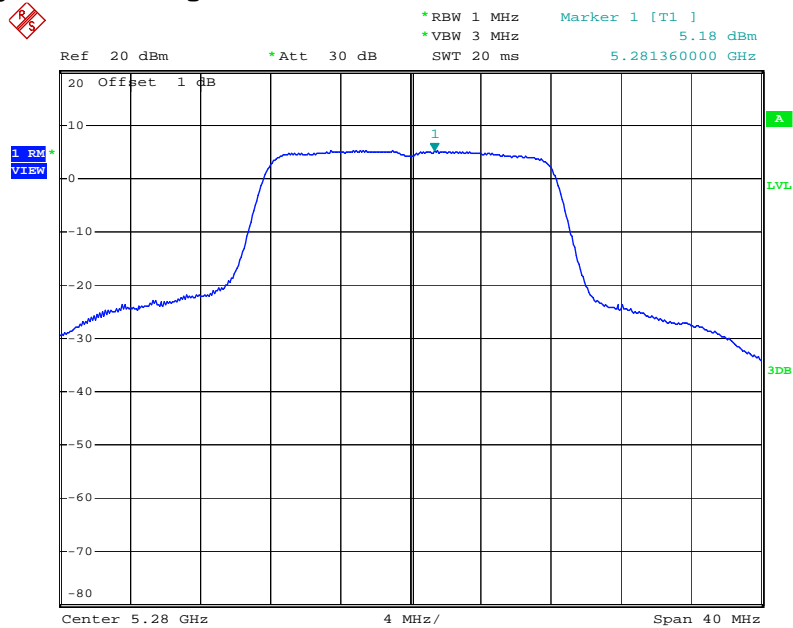
Date: 25.APR.2012 15:55:06

Power Density Plot on Configuration IEEE 802.11a 5260 MHz Port 2



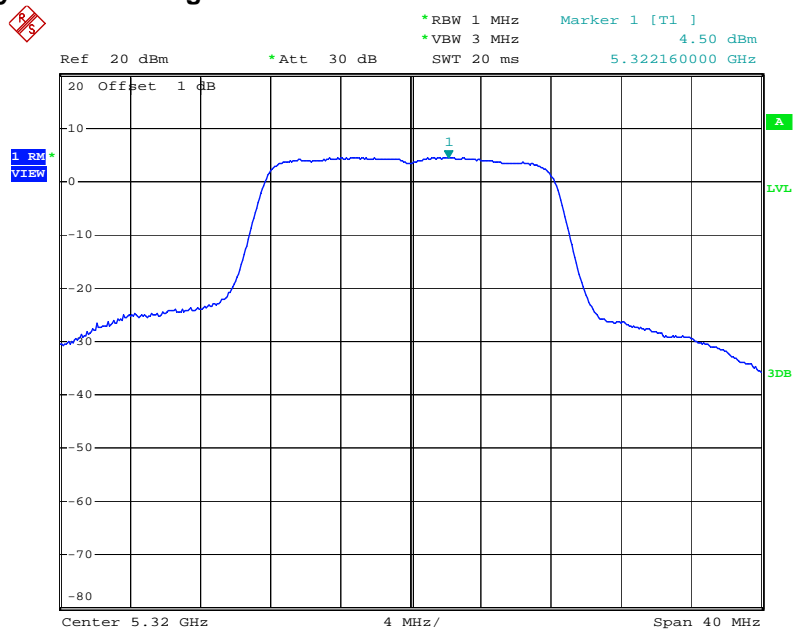
Date: 25.APR.2012 14:20:32

Power Density Plot on Configuration IEEE 802.11a 5280 MHz Port 2



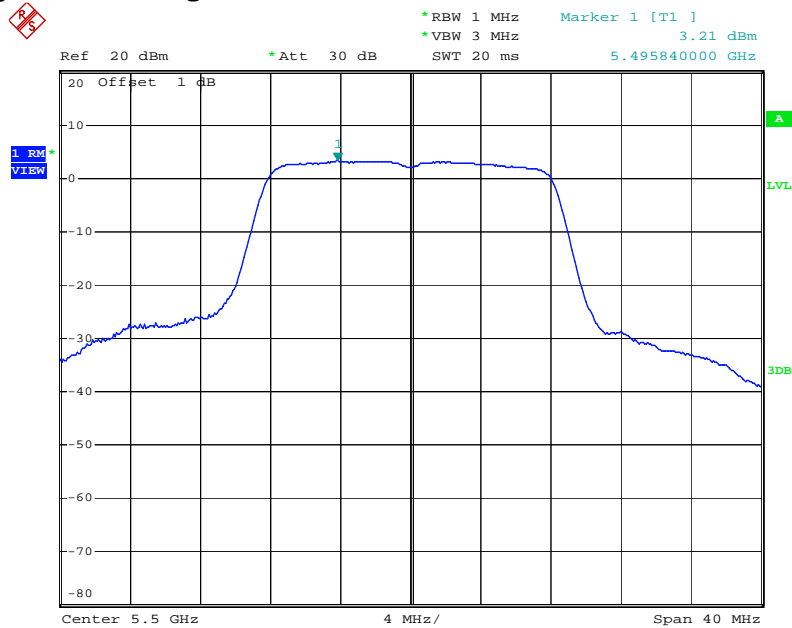
Date: 25.APR.2012 14:23:55

Power Density Plot on Configuration IEEE 802.11a 5320 MHz Port 2



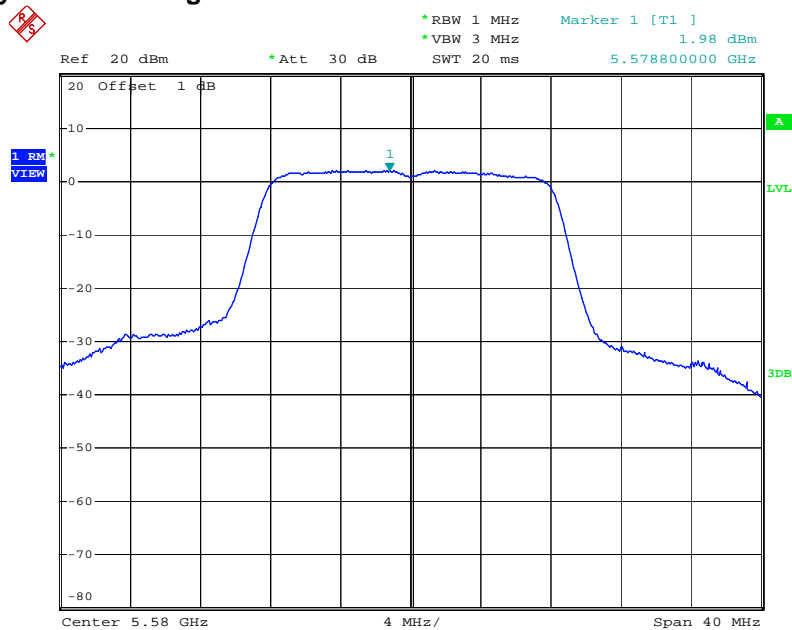
Date: 25.APR.2012 14:27:38

Power Density Plot on Configuration IEEE 802.11a 5500 MHz Port 2



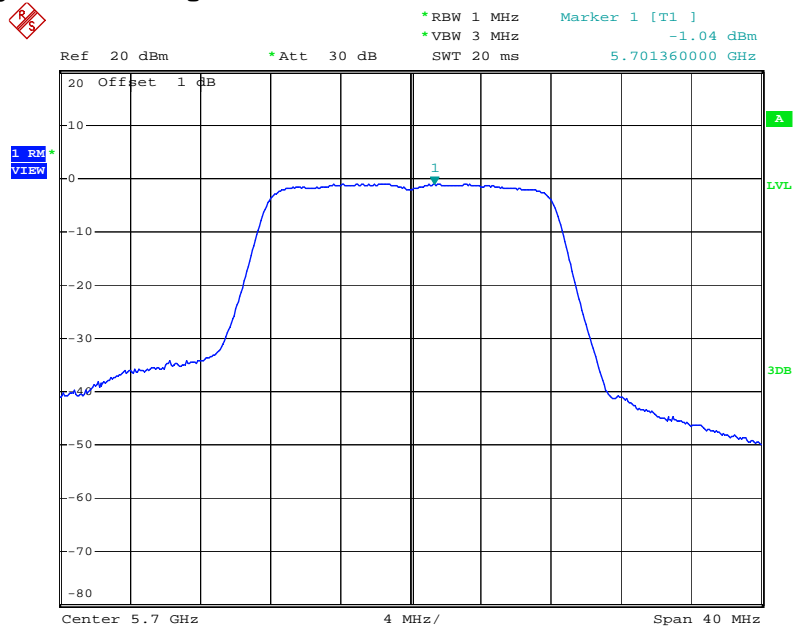
Date: 25.APR.2012 14:31:44

Power Density Plot on Configuration IEEE 802.11a 5580 MHz Port 2



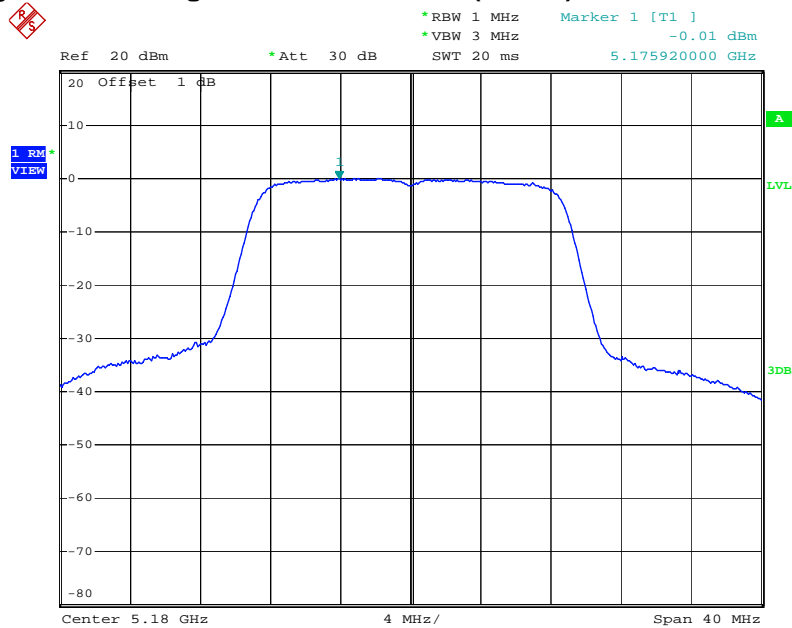
Date: 25.APR.2012 14:35:13

Power Density Plot on Configuration IEEE 802.11a 5700 MHz Port 2



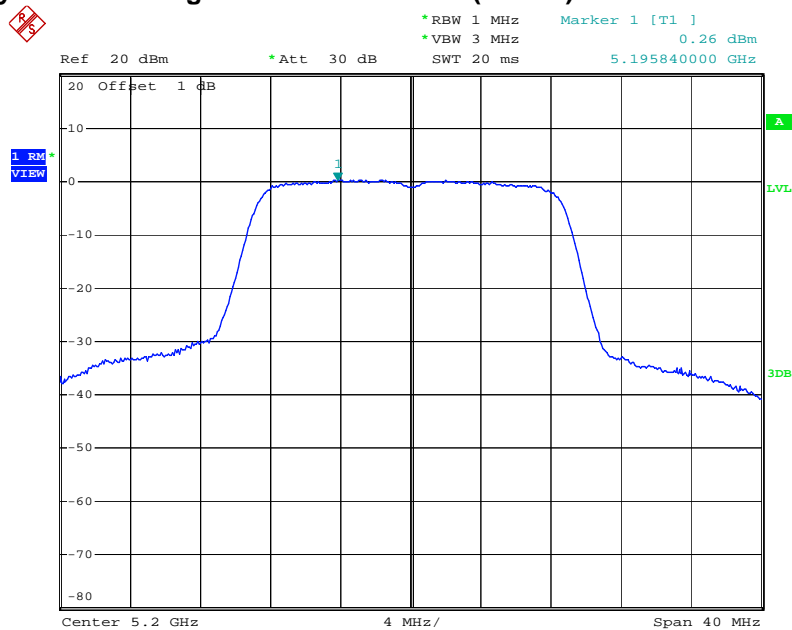
Date: 25.APR.2012 14:39:49

For Two Chains:
Power Density Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 1



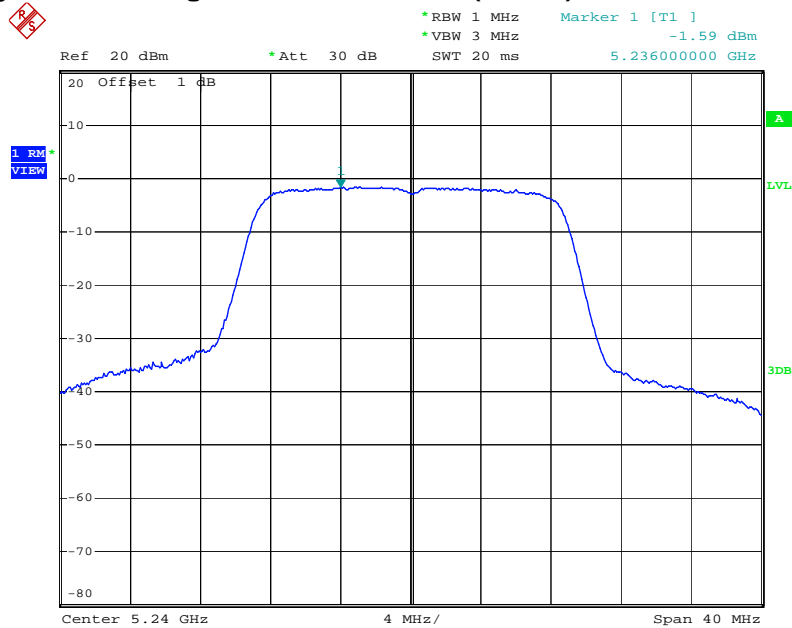
Date: 25.APR.2012 19:40:30

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 1



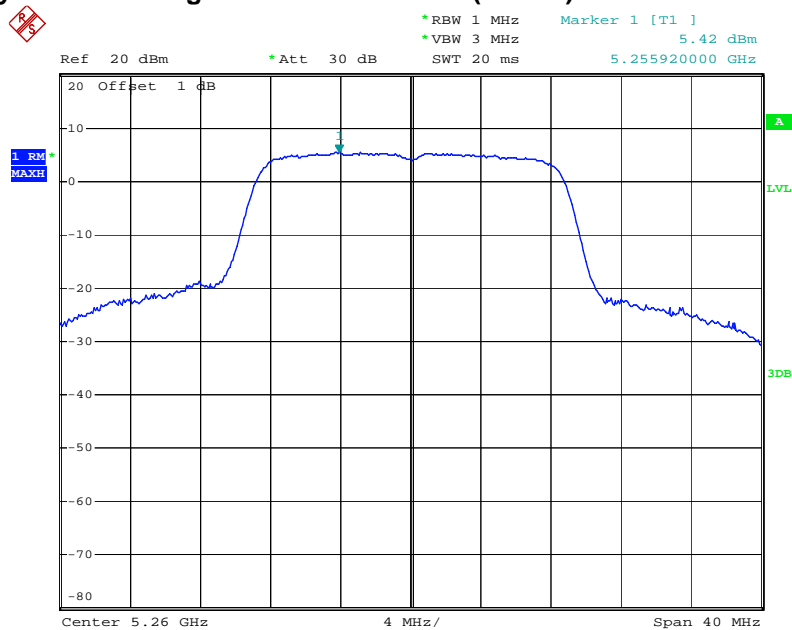
Date: 25.APR.2012 20:04:51

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 1



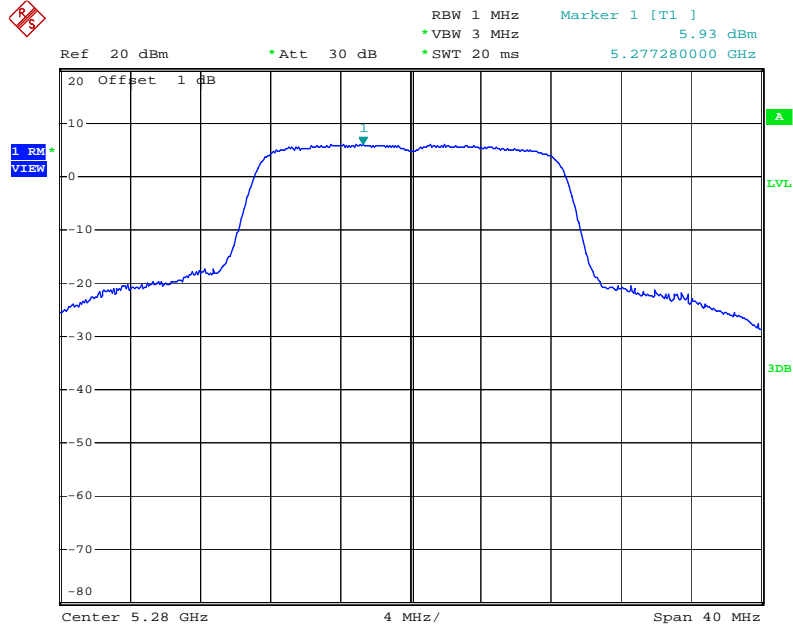
Date: 25.APR.2012 20:15:55

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 1



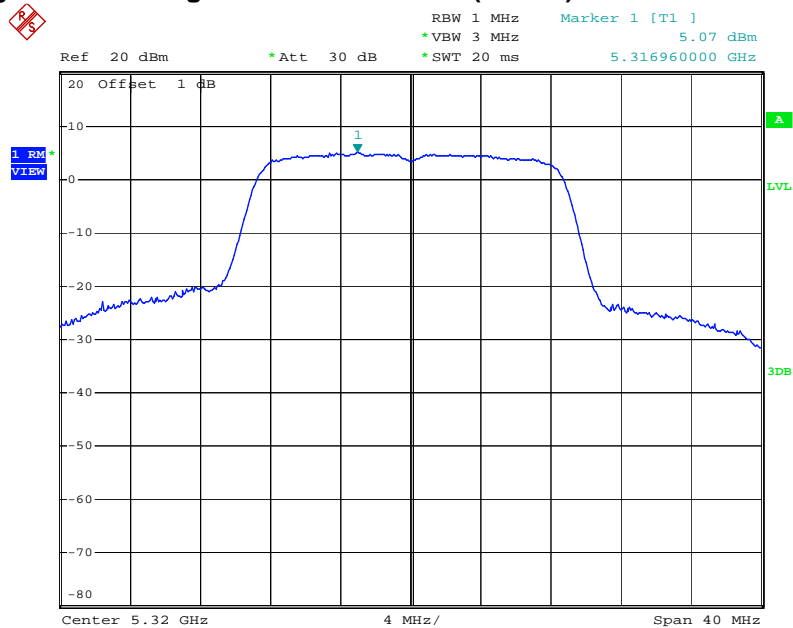
Date: 25.APR.2012 20:23:46

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 1



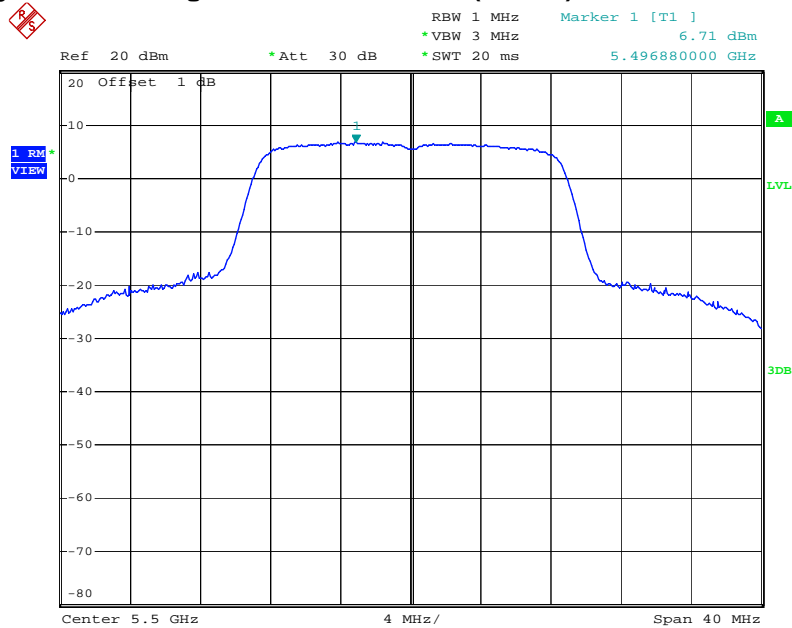
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Power Density Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 1



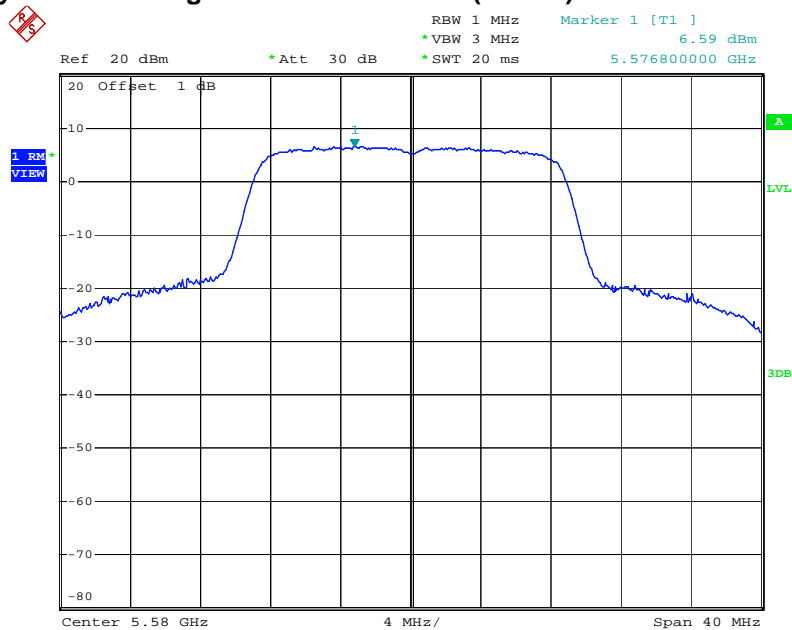
Date: 25.APR.2012 20:27:50

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 1



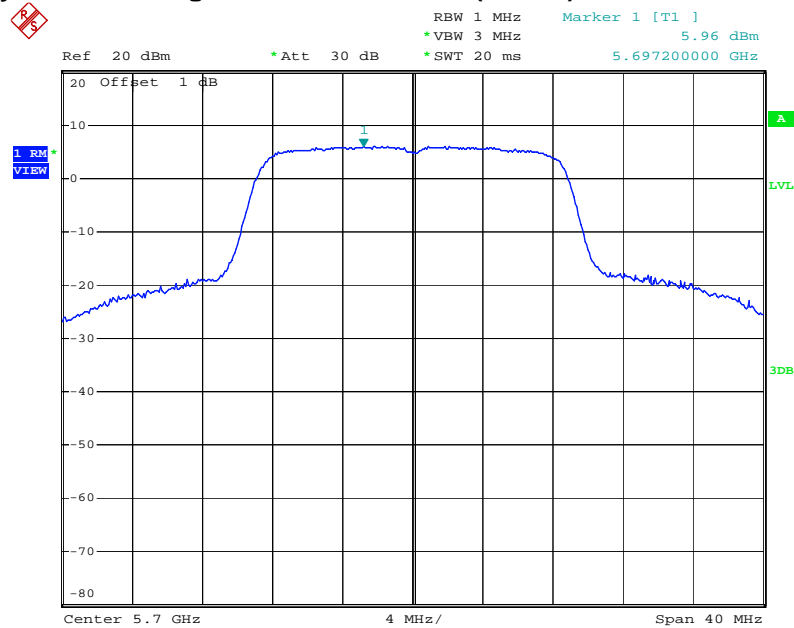
Date: 25.APR.2012 20:32:06

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 1



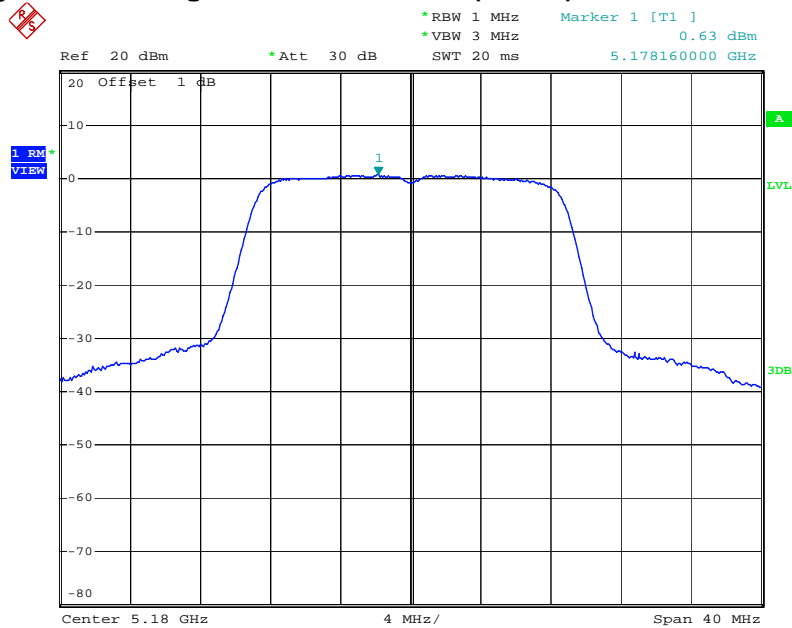
Date: 25.APR.2012 20:38:29

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 1



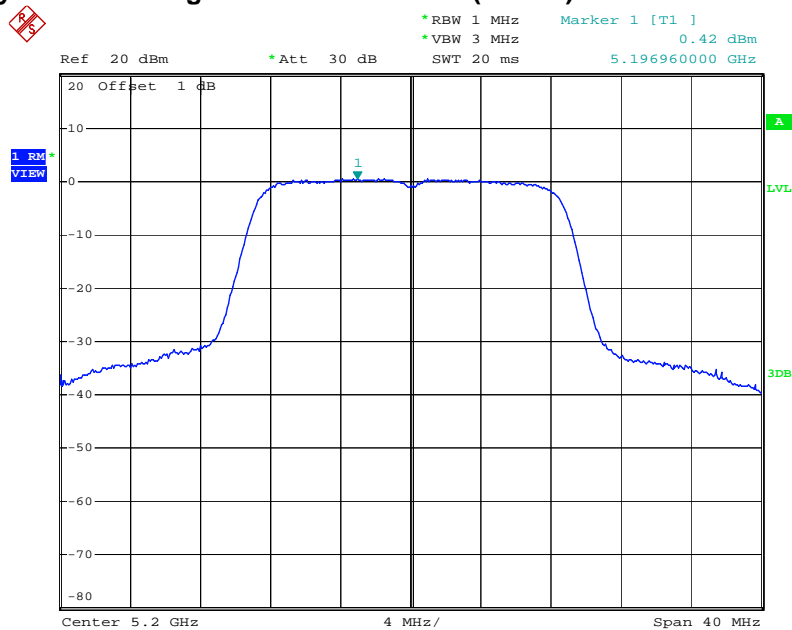
Date: 25.APR.2012 20:41:47

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 2



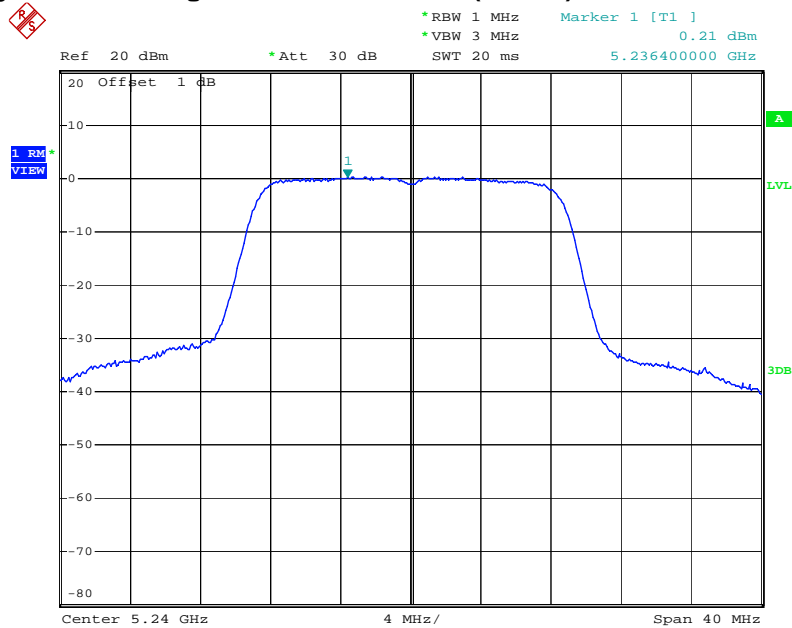
Date: 25.APR.2012 19:41:44

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 2



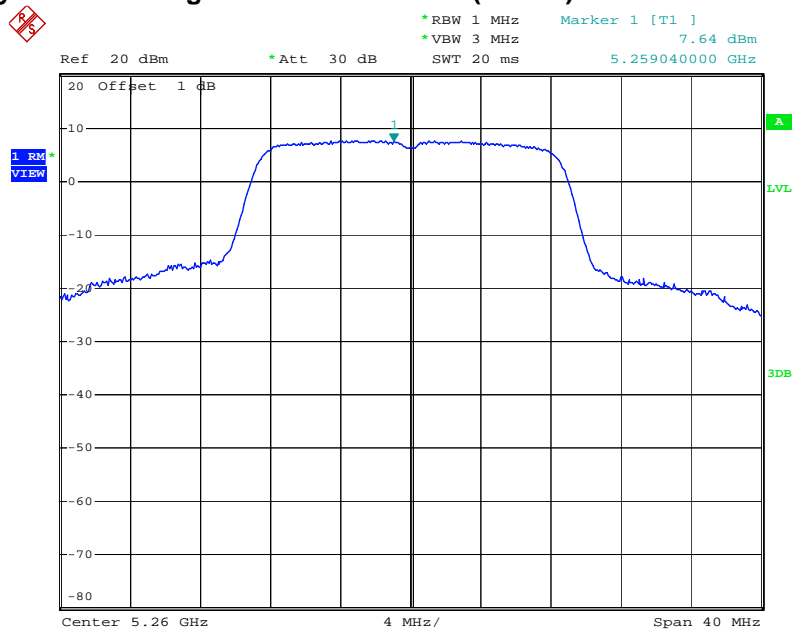
Date: 25.APR.2012 20:06:18

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 2



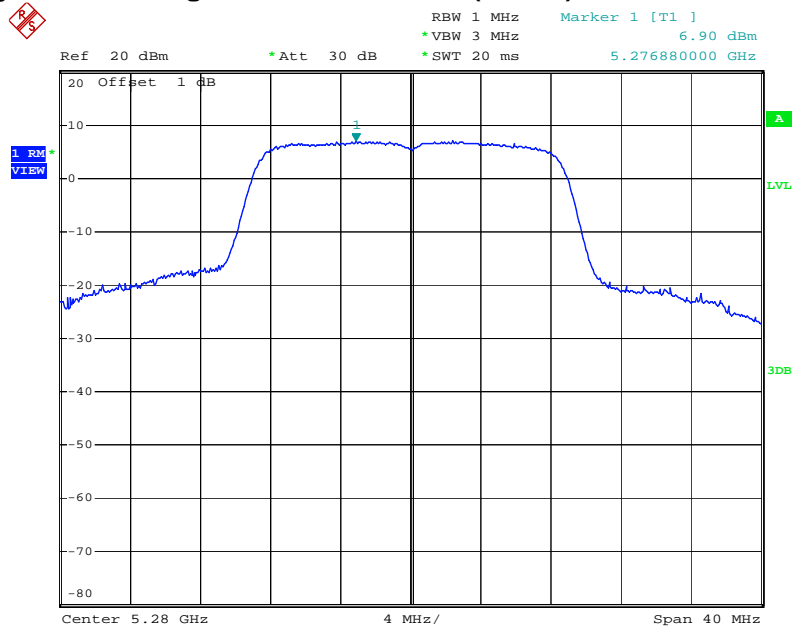
Date: 25.APR.2012 20:16:55

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 2



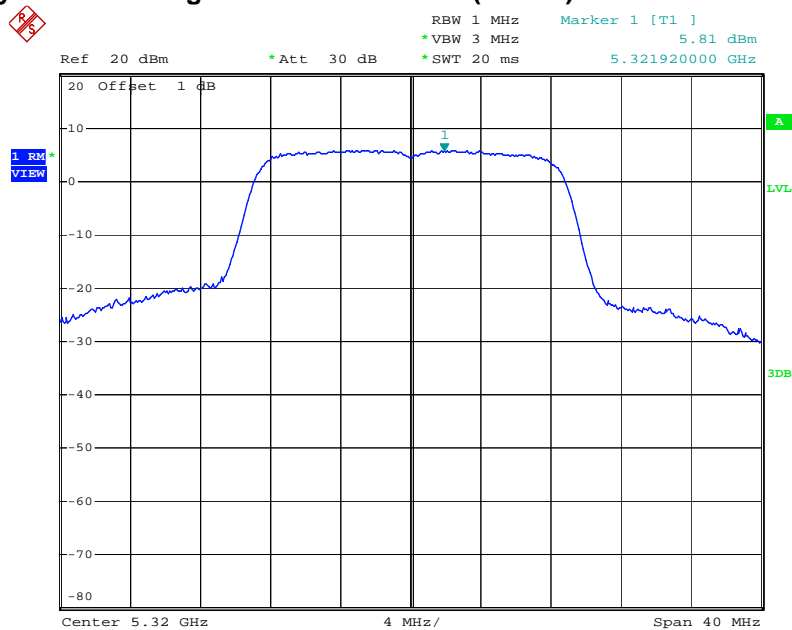
Date: 25.APR.2012 20:23:05

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 2



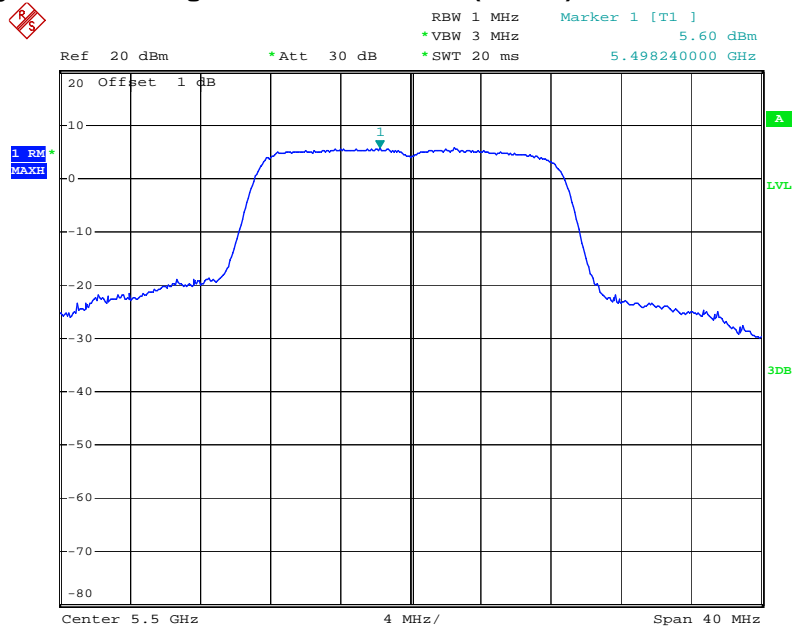
Date: 25.APR.2012 20:26:42

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 2



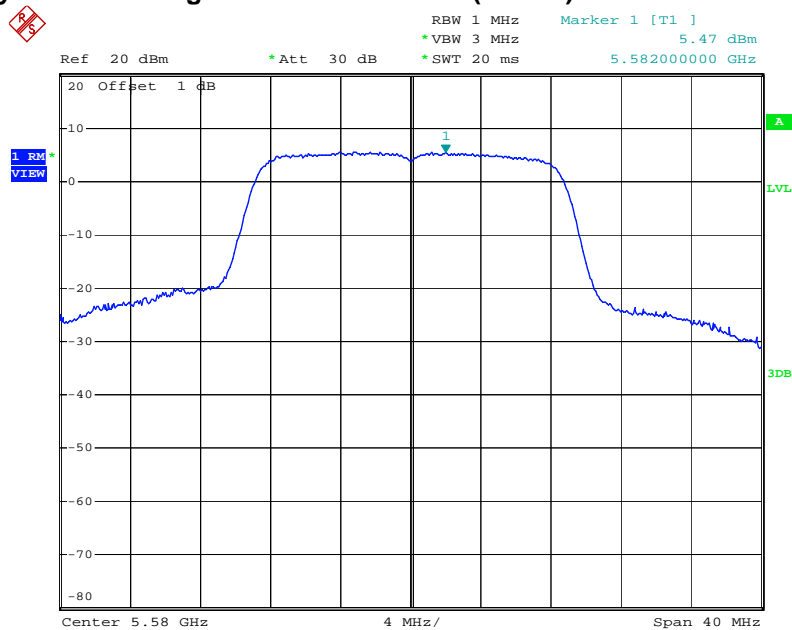
Date: 25.APR.2012 20:28:33

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 2



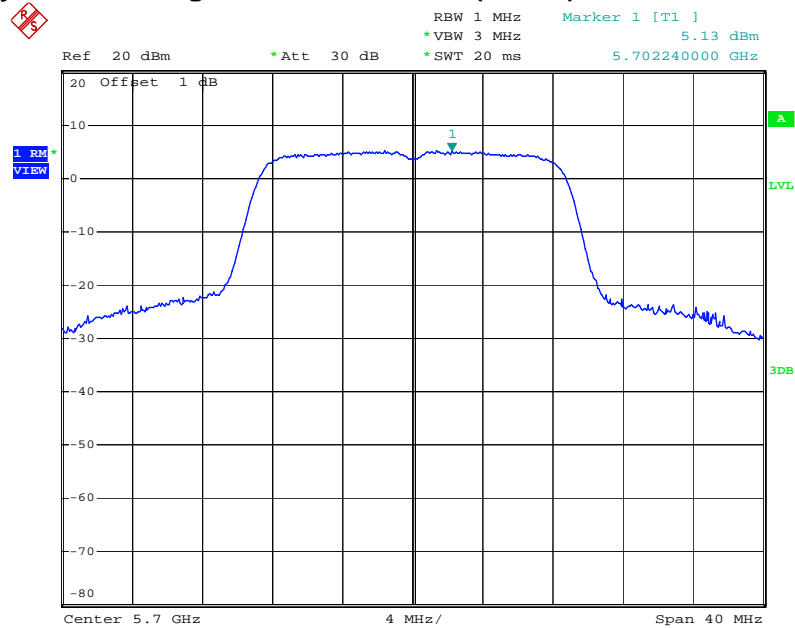
Date: 25.APR.2012 20:33:12

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 2



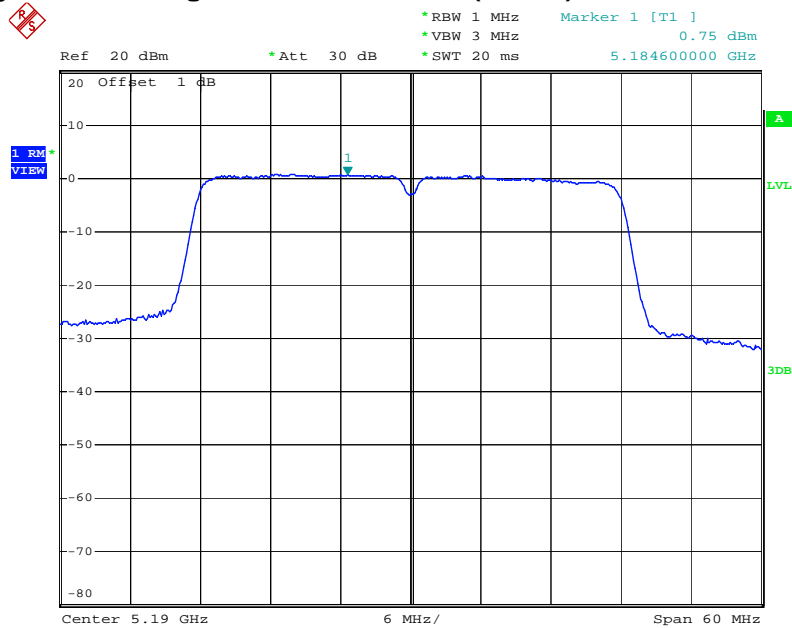
Date: 25.APR.2012 20:39:43

Power Density Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 2



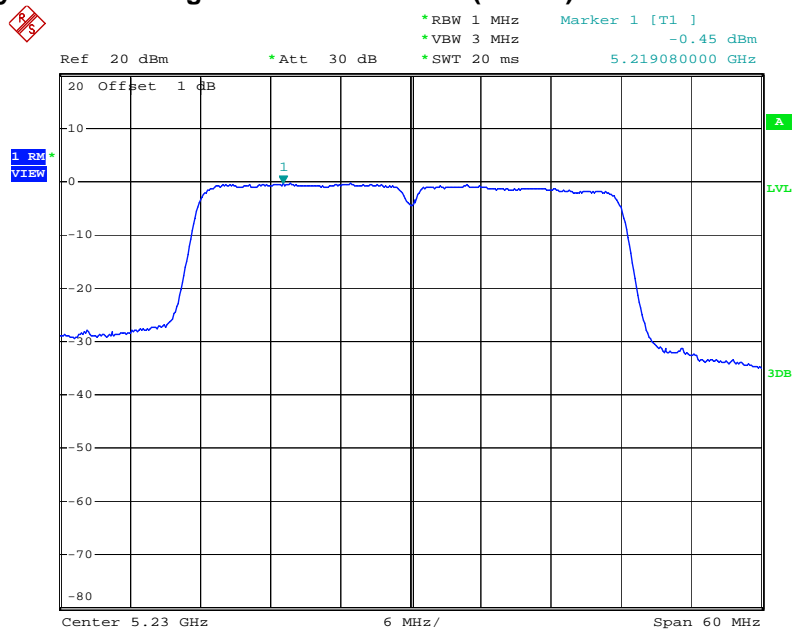
Date: 25.APR.2012 20:43:08

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 1



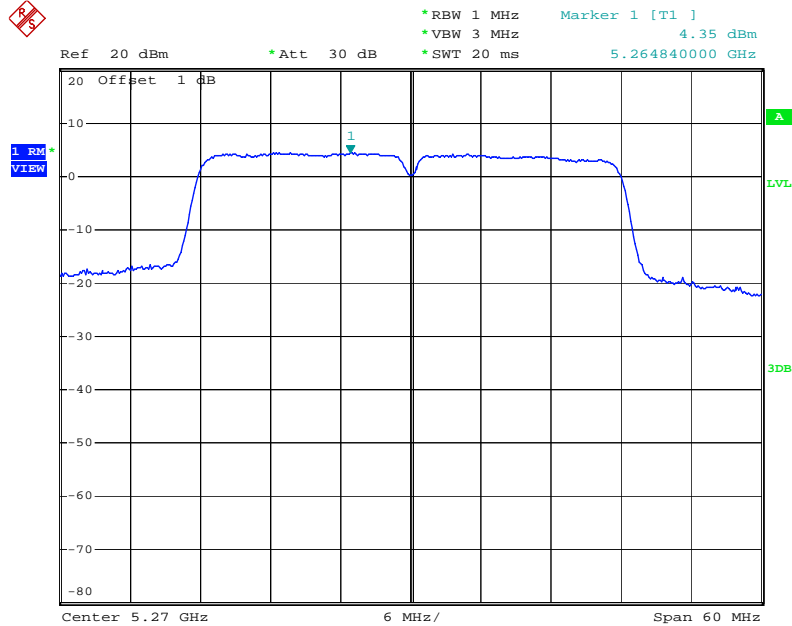
Date: 25.APR.2012 21:05:45

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 1



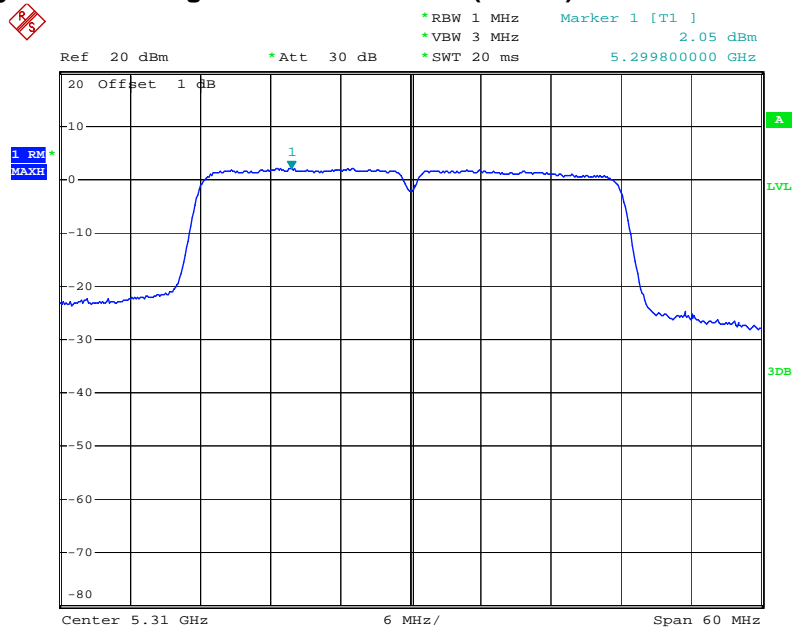
Date: 25.APR.2012 21:10:18

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 1



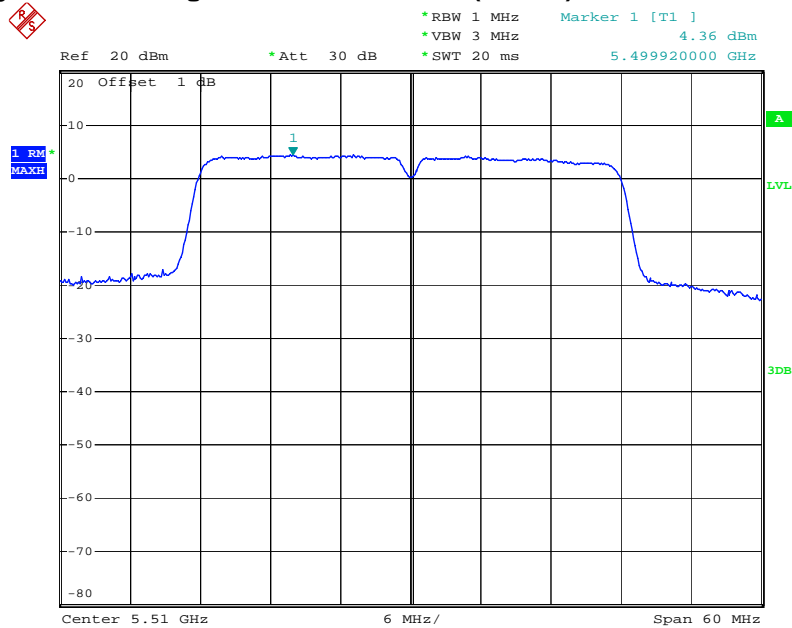
Date: 25.APR.2012 21:14:43

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 1



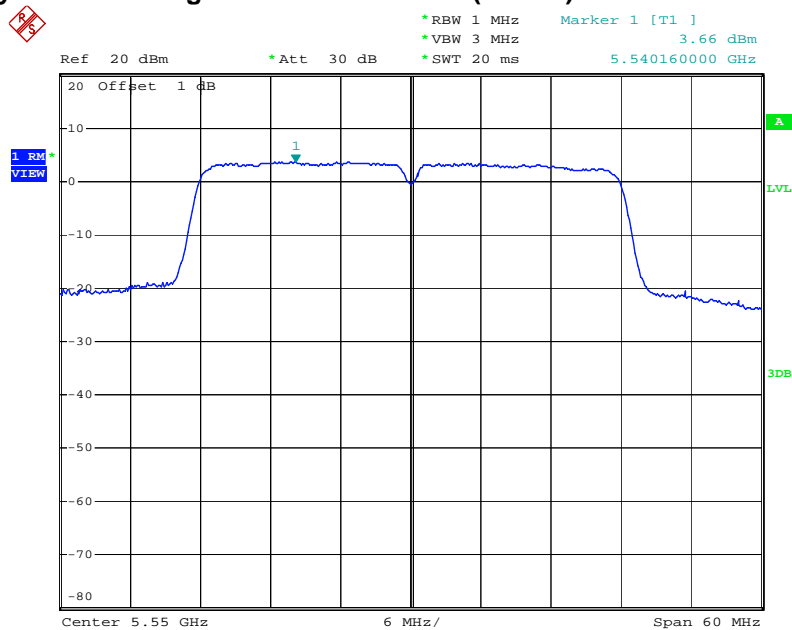
Date: 25.APR.2012 21:30:31

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 1



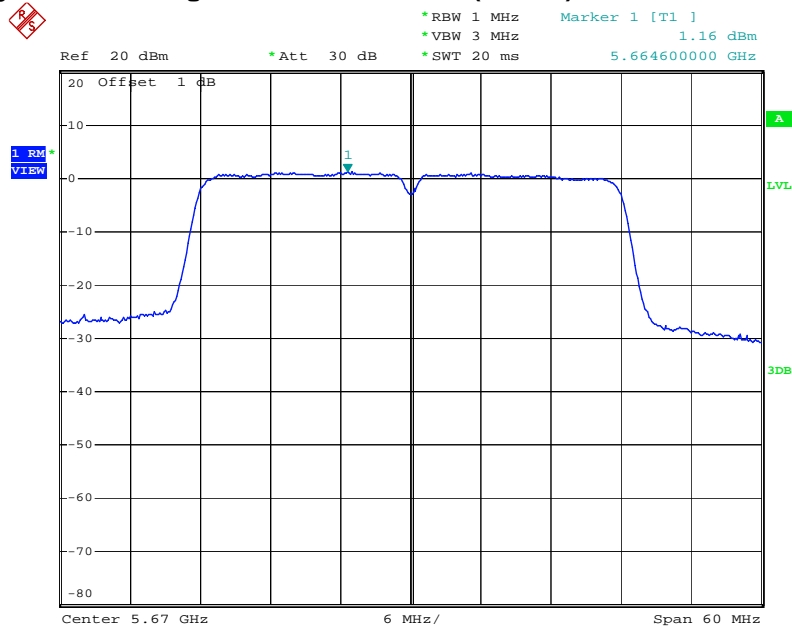
Date: 25.APR.2012 21:28:25

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 1



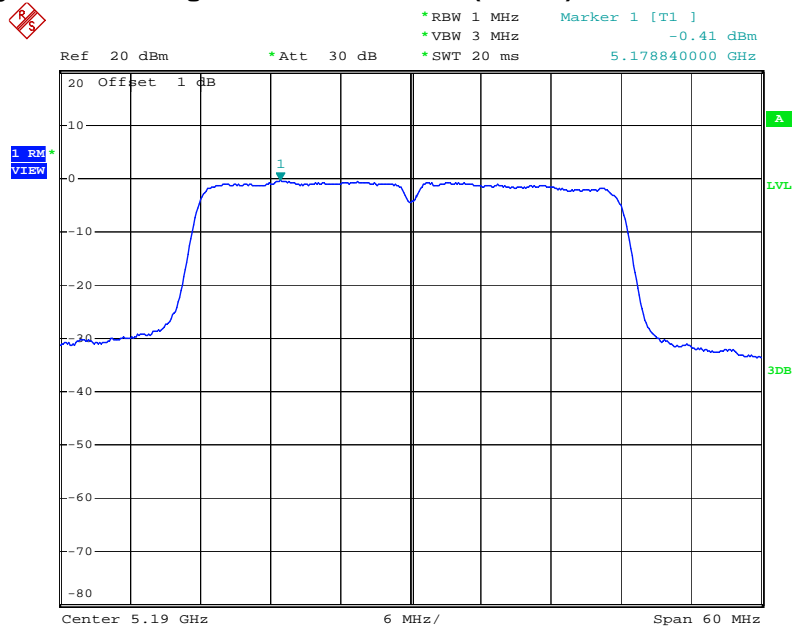
Date: 25.APR.2012 21:32:38

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 1



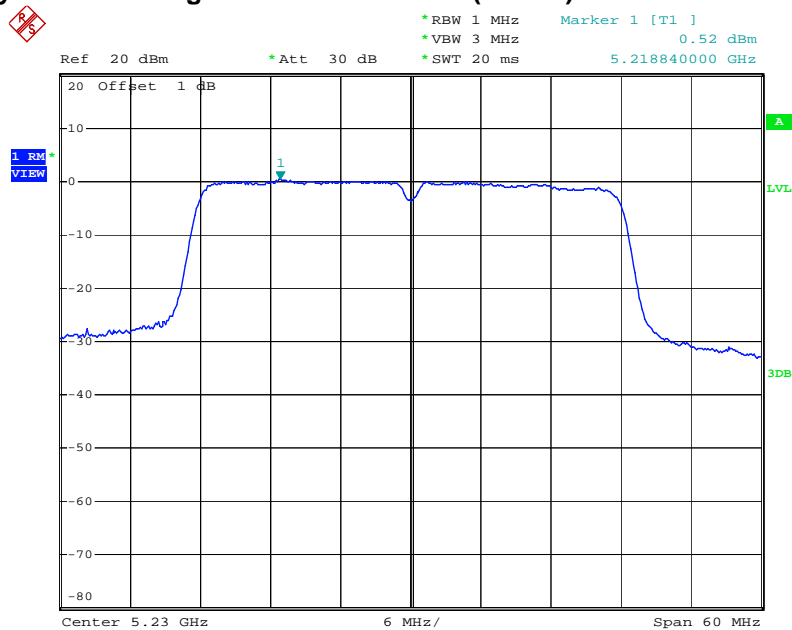
Date: 25.APR.2012 21:34:31

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 2



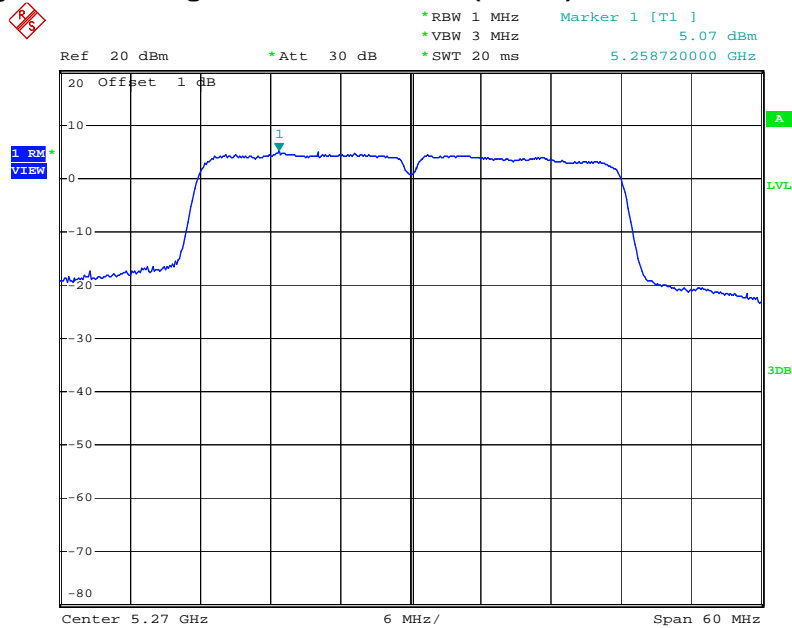
Date: 25.APR.2012 21:07:35

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 2



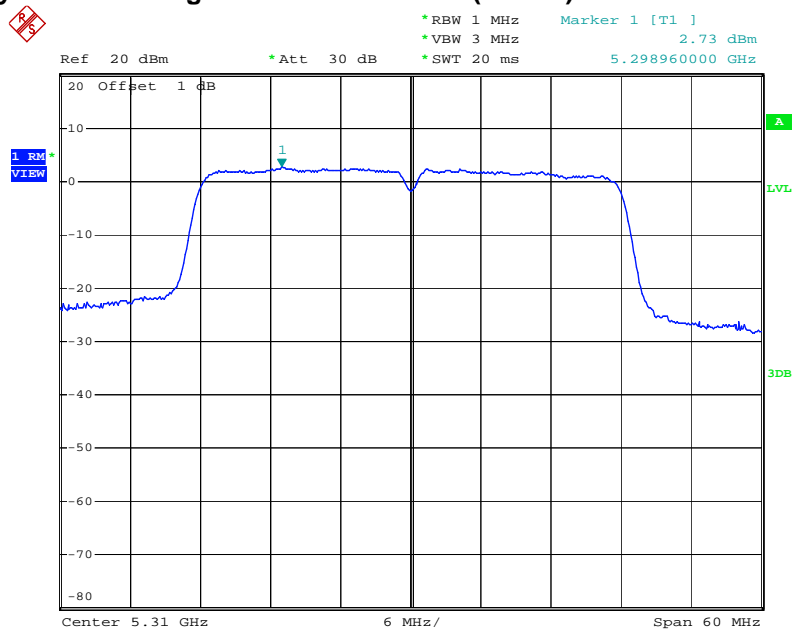
Date: 25.APR.2012 21:11:15

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 2



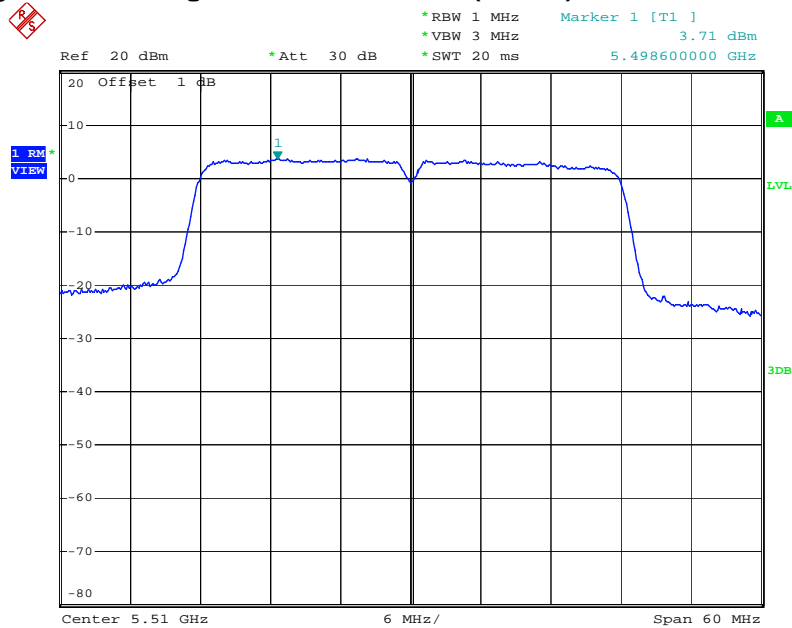
Date: 25.APR.2012 21:15:44

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 2



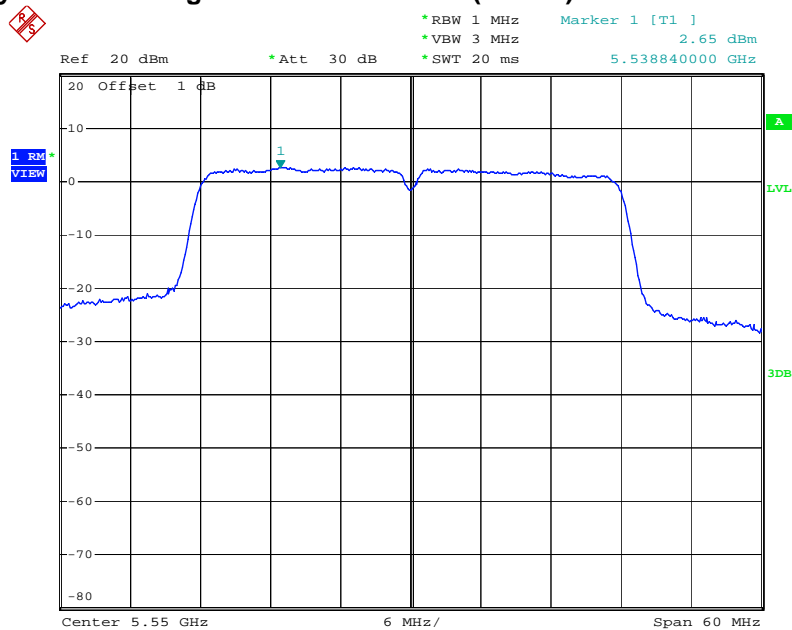
Date: 25.APR.2012 21:31:22

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 2



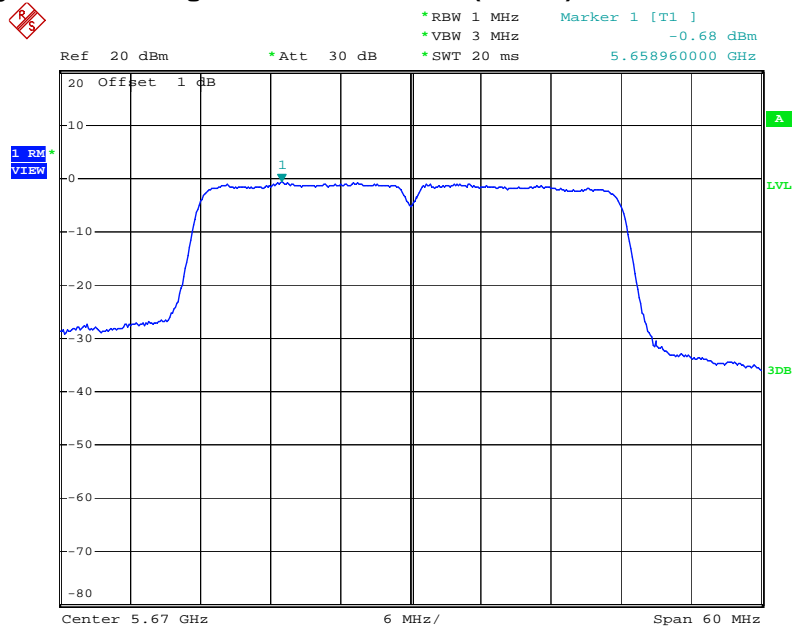
Date: 25.APR.2012 21:29:06

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 2



Date: 25.APR.2012 21:33:28

Power Density Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 2



Date: 25.APR.2012 21:35:37

3.5 Peak Excursion Measurement

3.5.1 Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

3.5.2 Measuring Instruments and Setting

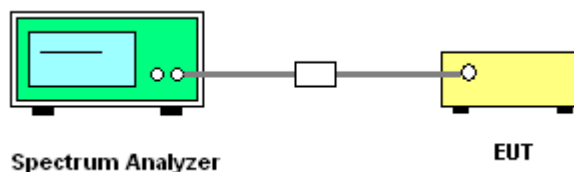
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VB	3000 kHz (Peak Trace) / 300 kHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Max Hold
Sweep Time	60s

3.5.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 Db for all frequencies across the emissions bandwidth. Submit a plot.
3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
4. Average Trace: Method #3—video averaging with max hold—and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to “free run”. Set RBW = 1 MHz. Set VBW $\geq 1/T$ (IEEE 802.11a VBW = 300kHz $\geq 1/4\mu\text{s}$). Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.
5. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner. (Only for IEEE 802.11n test)

3.5.4 Test Setup Layout



3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.5.7 Test Result of Peak Excursion

Final Test Date	Apr. 25, 2012	Test Site No.	TH01-HY
Temperature	25.9°C	Humidity	30%
Test Engineer	Ian	Configurations	802.11a/n

For Single Chain:**Configuration of IEEE 802.11a Port 2**

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5180 MHz	5.47	13	Complies
5200 MHz	5.53	13	Complies
5240 MHz	5.36	13	Complies
5260 MHz	5.09	13	Complies
5280 MHz	5.33	13	Complies
5320 MHz	5.08	13	Complies
5500 MHz	5.11	13	Complies
5580 MHz	5.30	13	Complies
5700 MHz	5.07	13	Complies

For Two Chains:**Configuration IEEE 802.11n (20MHz) Port 1**

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5180 MHz	5.65	13	Complies
5200 MHz	5.60	13	Complies
5240 MHz	5.58	13	Complies
5260 MHz	5.91	13	Complies
5280 MHz	5.70	13	Complies
5320 MHz	6.35	13	Complies
5500 MHz	6.00	13	Complies
5580 MHz	6.15	13	Complies
5700 MHz	6.08	13	Complies

Configuration IEEE 802.11n (20MHz) Port 2

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5180 MHz	7.63	13	Complies
5200 MHz	7.27	13	Complies
5240 MHz	7.67	13	Complies
5260 MHz	7.36	13	Complies
5280 MHz	7.85	13	Complies
5320 MHz	7.18	13	Complies
5500 MHz	7.85	13	Complies
5580 MHz	7.70	13	Complies
5700 MHz	7.79	13	Complies

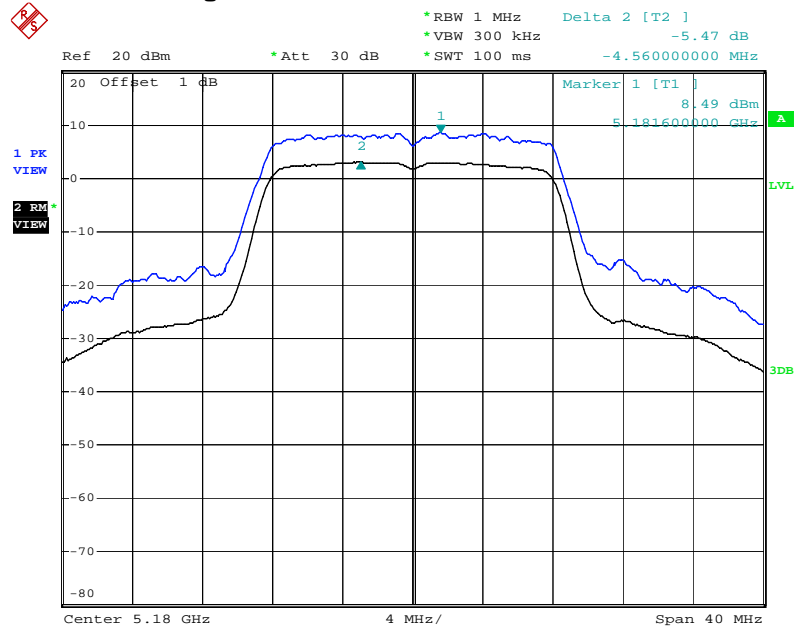
Configuration IEEE 802.11n (40MHz) Port 1

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5190 MHz	6.56	13	Complies
5230 MHz	6.72	13	Complies
5270 MHz	7.02	13	Complies
5310 MHz	6.93	13	Complies
5510 MHz	7.13	13	Complies
5550 MHz	7.07	13	Complies
5670 MHz	6.76	13	Complies

Configuration IEEE 802.11n (40MHz) Port 2

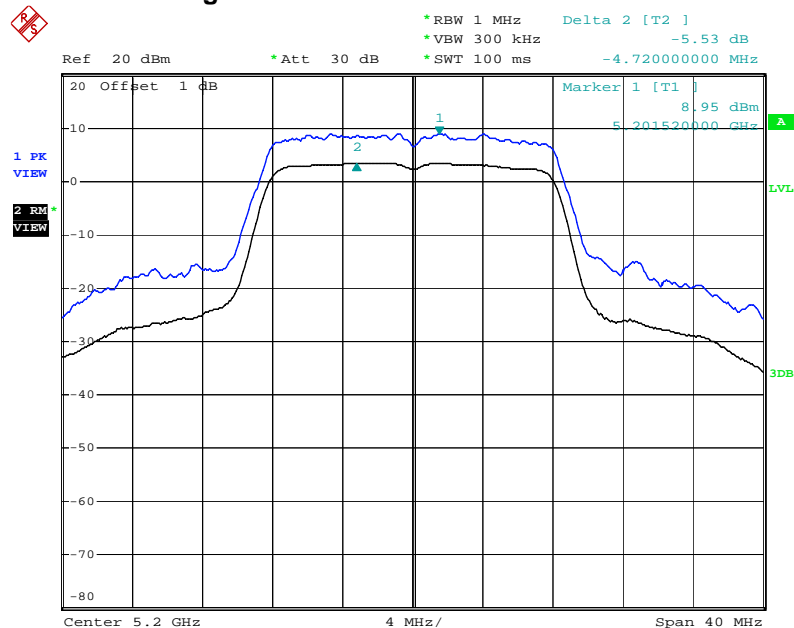
Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5190 MHz	7.50	13	Complies
5230 MHz	7.49	13	Complies
5270 MHz	7.37	13	Complies
5310 MHz	7.45	13	Complies
5510 MHz	7.90	13	Complies
5550 MHz	8.15	13	Complies
5670 MHz	7.58	13	Complies

For Single Chain:
Peak Excursion Plot on Configuration IEEE 802.11a 5180 MHz Port 2



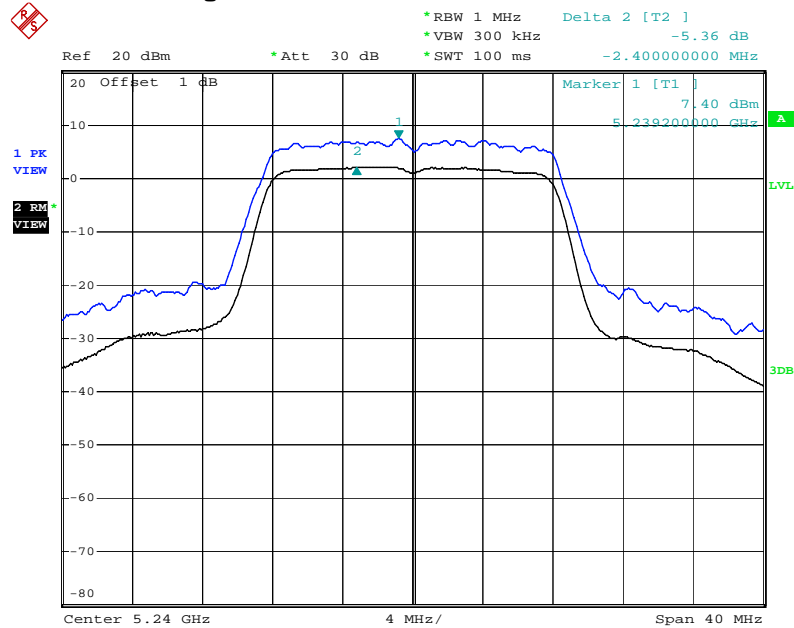
Date: 25.APR.2012 11:51:29

Peak Excursion Plot on Configuration IEEE 802.11a 5200 MHz Port 2



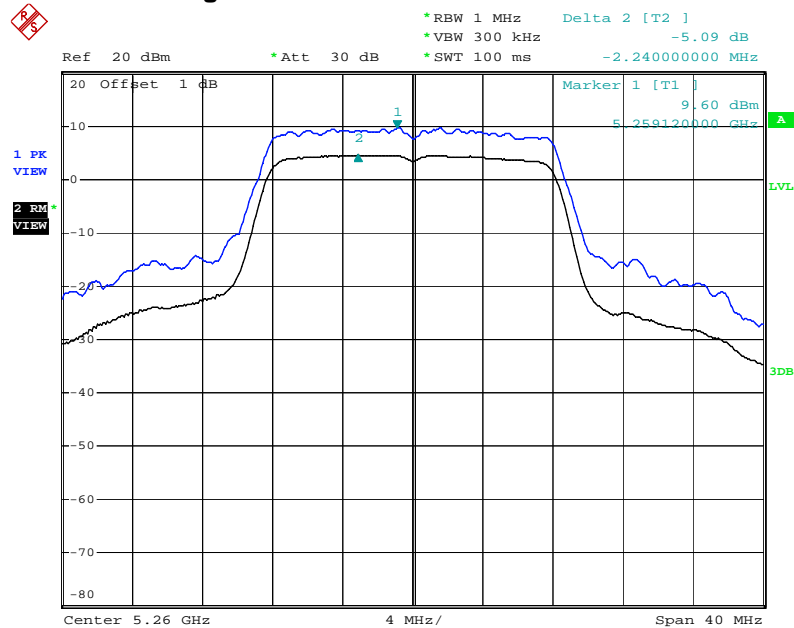
Date: 25.APR.2012 11:54:57

Peak Excursion Plot on Configuration IEEE 802.11a 5240 MHz Port 2



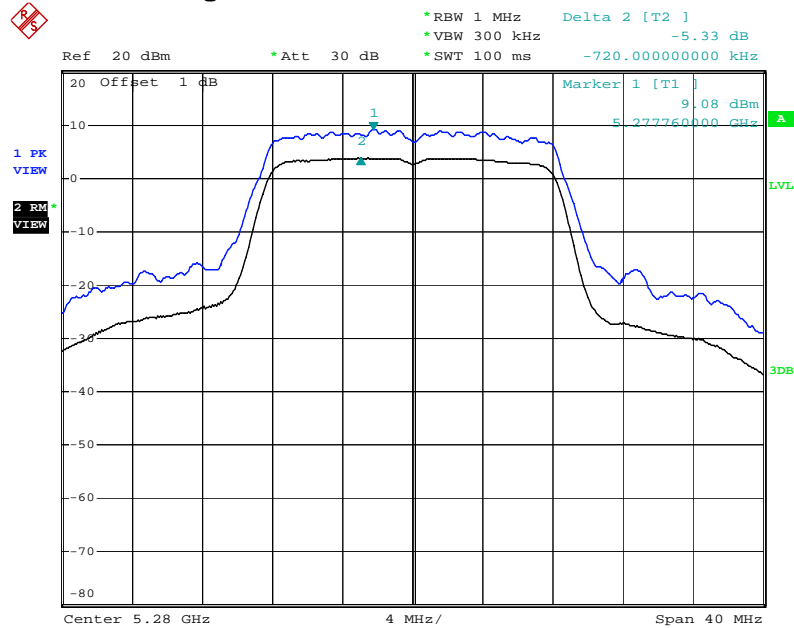
Date: 25.APR.2012 13:44:02

Peak Excursion Plot on Configuration IEEE 802.11a 5260 MHz Port 2



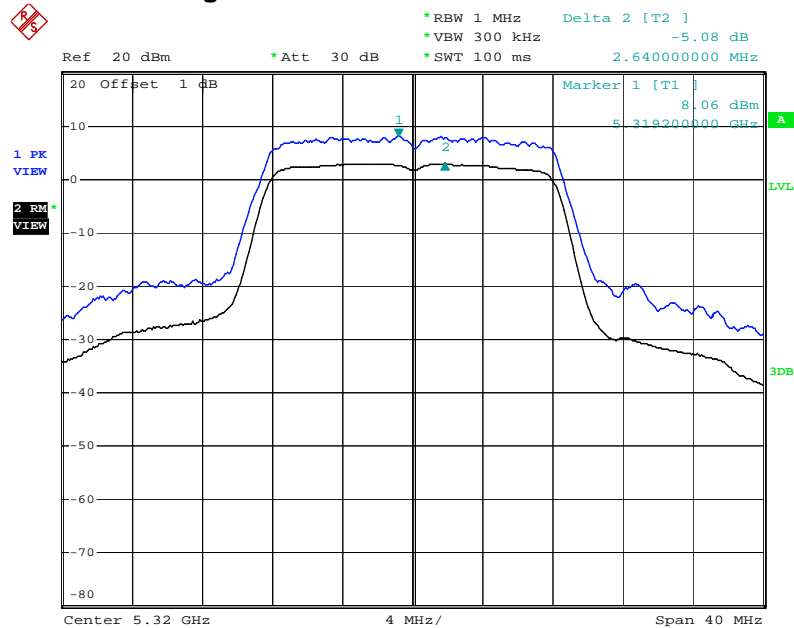
Date: 25.APR.2012 14:21:04

Peak Excursion Plot on Configuration IEEE 802.11a 5280 MHz Port 2



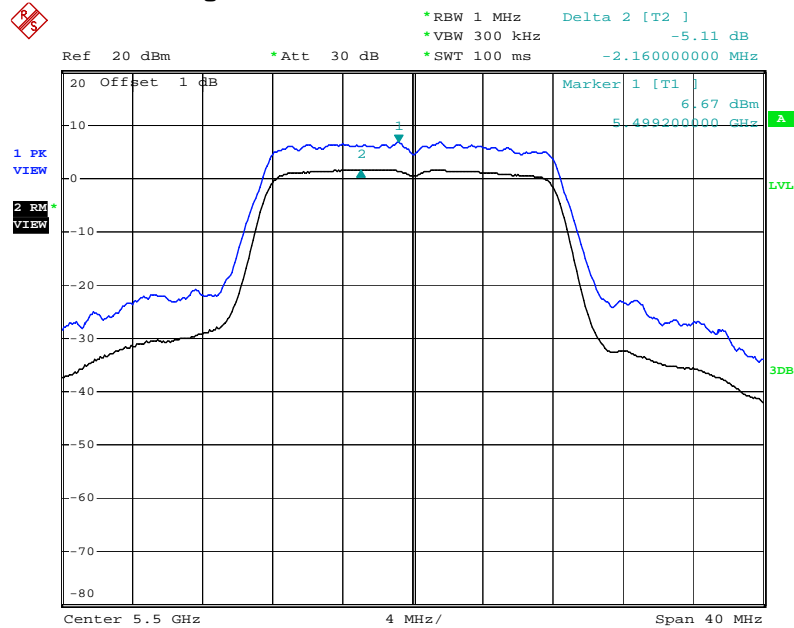
Date: 25.APR.2012 14:24:31

Peak Excursion Plot on Configuration IEEE 802.11a 5320 MHz Port 2



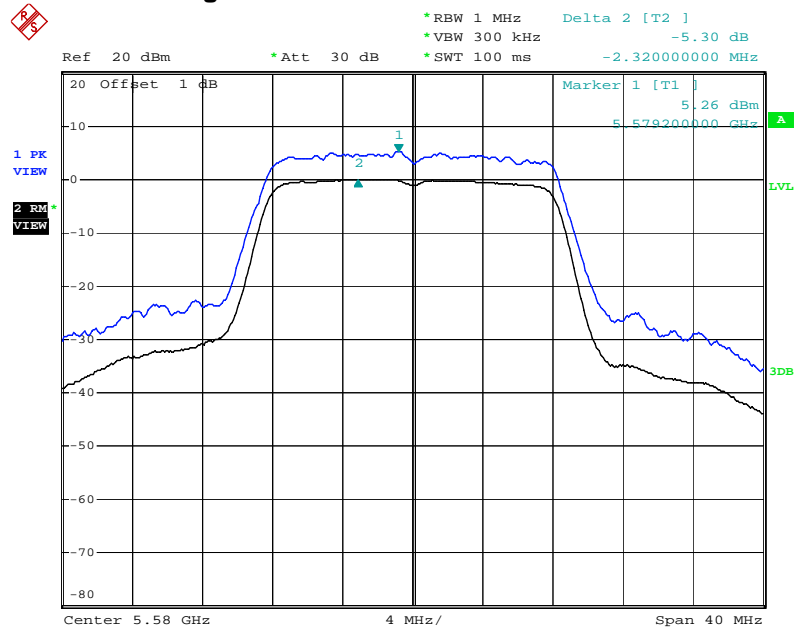
Date: 25.APR.2012 14:28:05

Peak Excursion Plot on Configuration IEEE 802.11a 5500 MHz Port 2



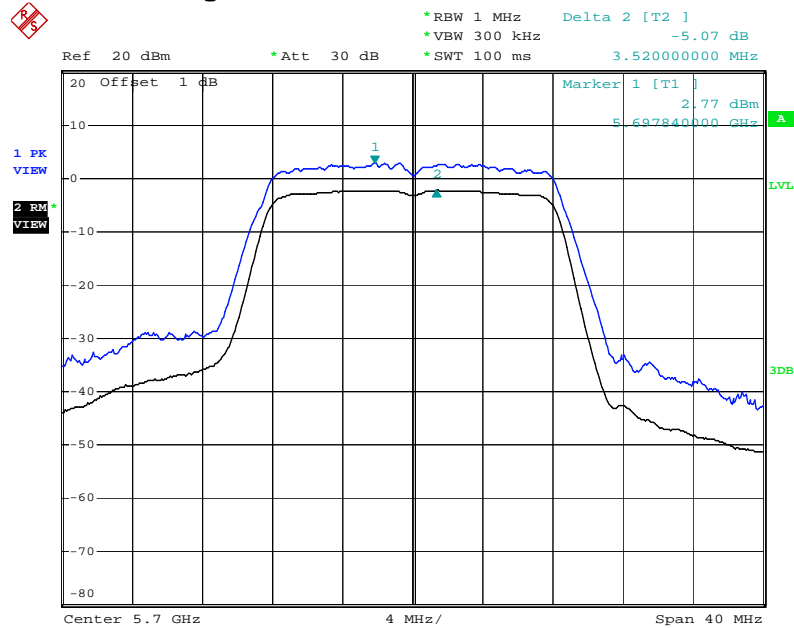
Date: 25.APR.2012 14:32:12

Peak Excursion Plot on Configuration IEEE 802.11a 5580 MHz Port 2



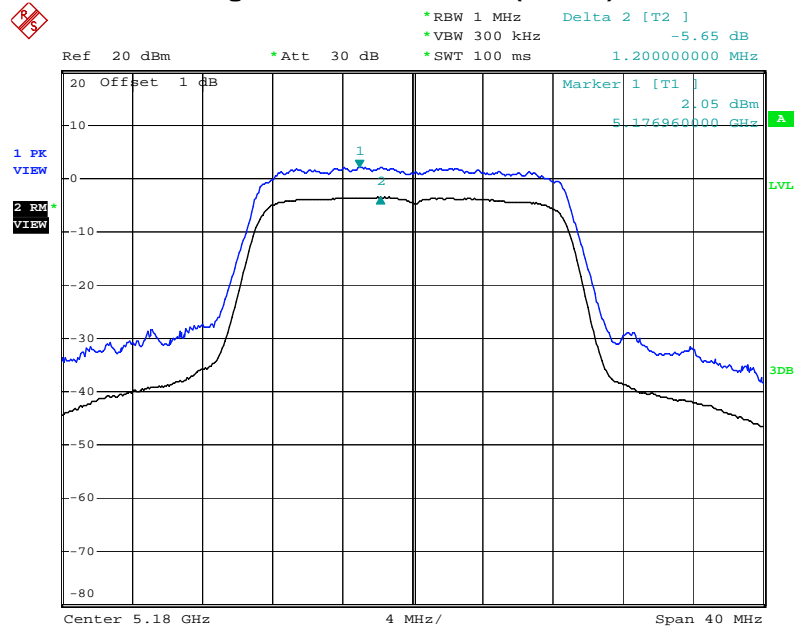
Date: 25.APR.2012 14:37:41

Peak Excursion Plot on Configuration IEEE 802.11a 5700 MHz Port 2



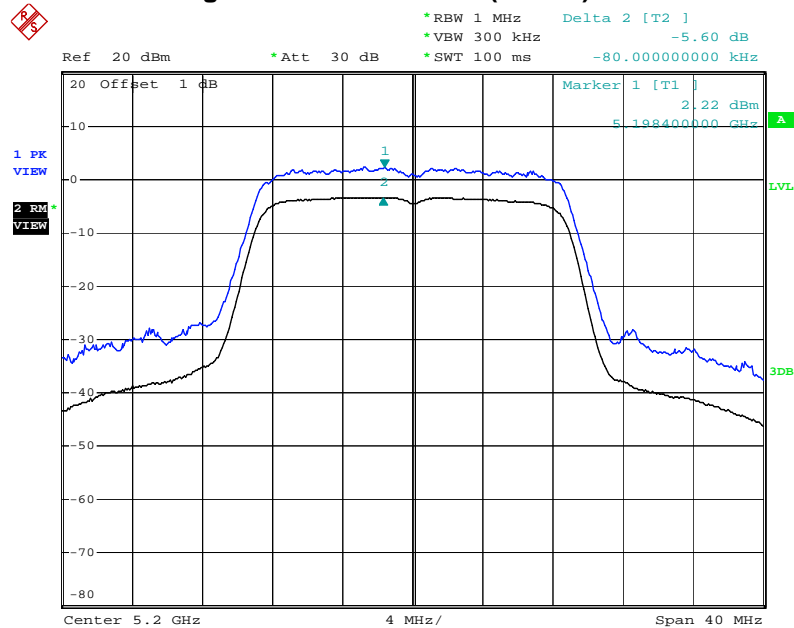
Date: 25.APR.2012 14:40:19

For Two Chains:
P Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 1



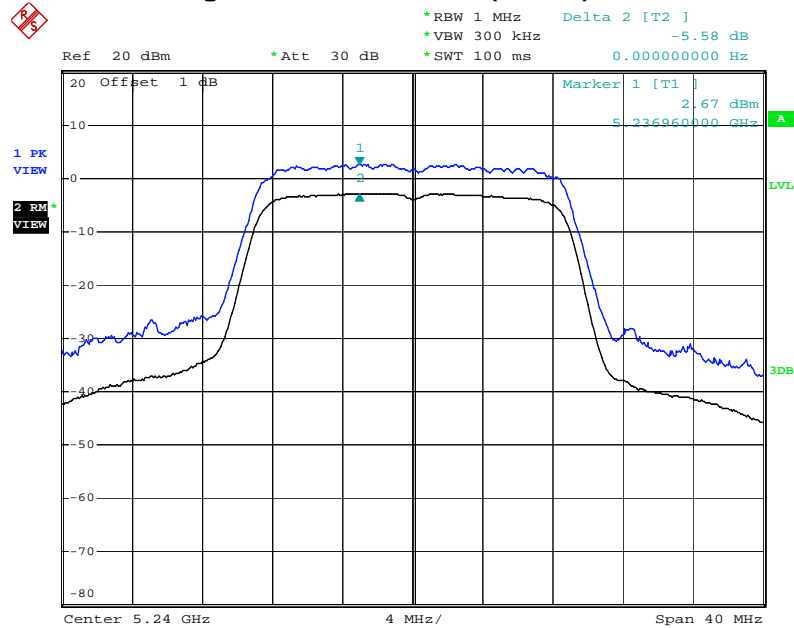
Date: 25.APR.2012 22:12:00

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 1



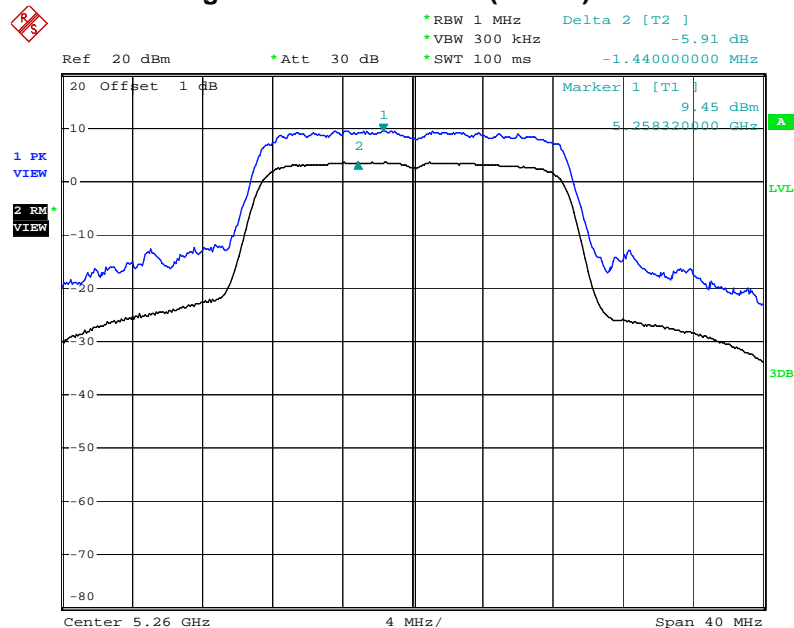
Date: 25.APR.2012 22:13:57

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 1



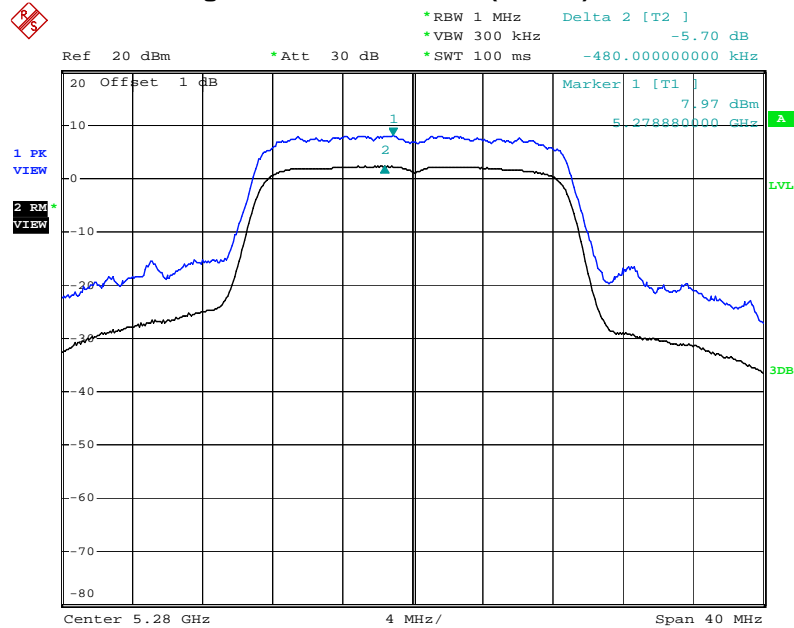
Date: 25.APR.2012 22:15:52

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 1



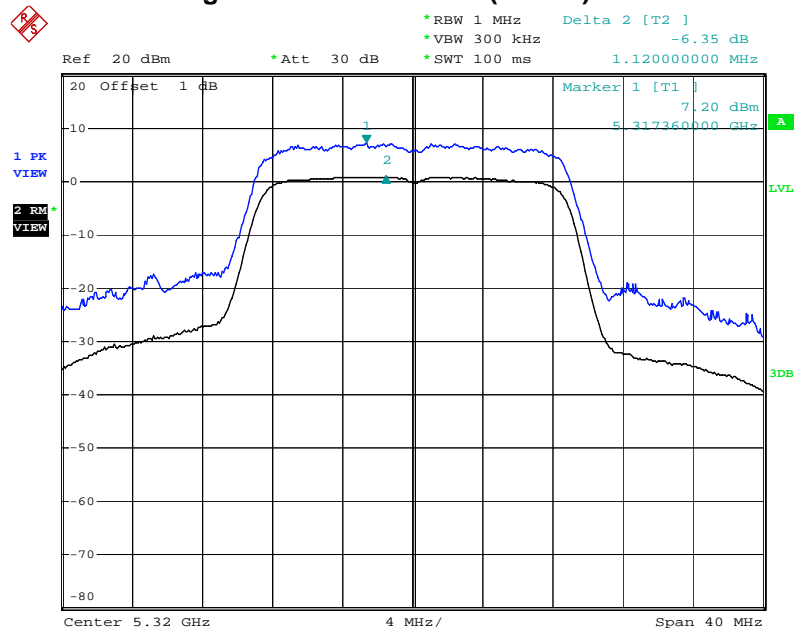
Date: 25.APR.2012 22:17:38

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 1



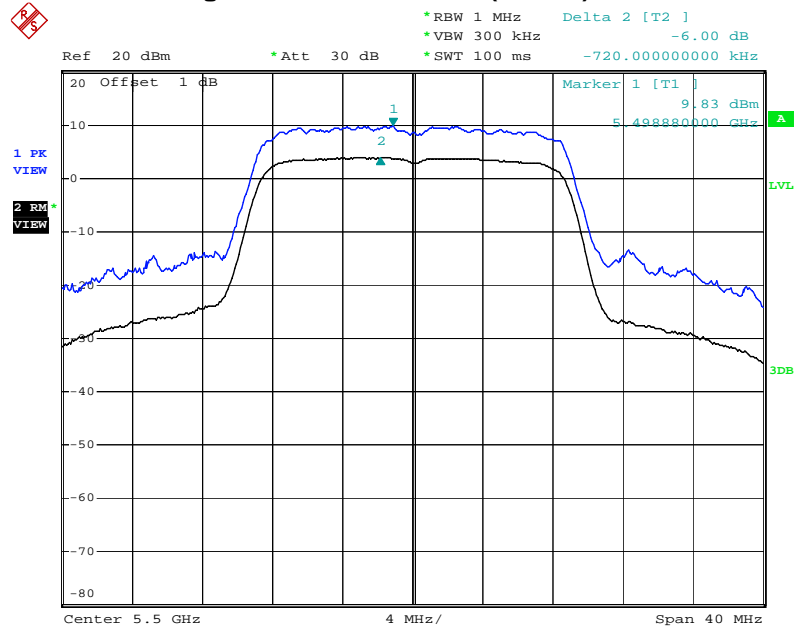
Date: 25.APR.2012 22:20:15

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 1



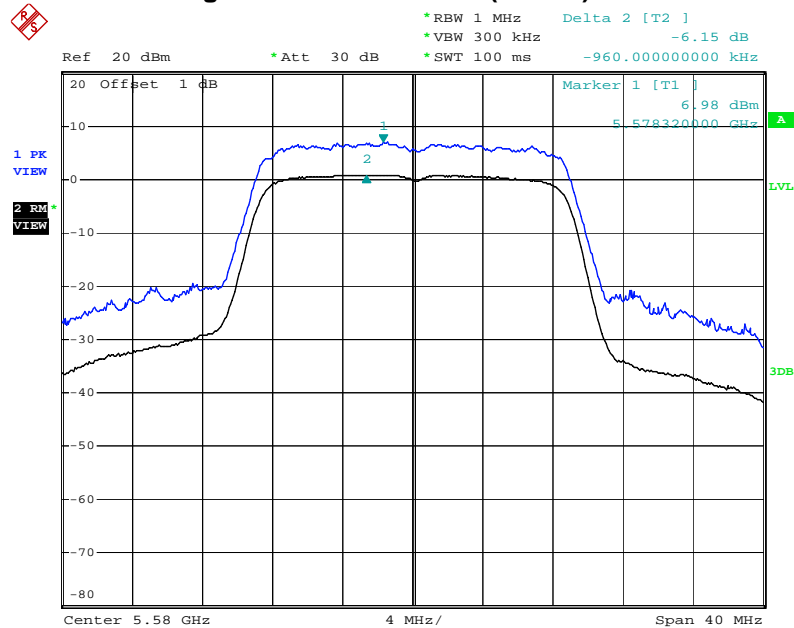
Date: 25.APR.2012 22:22:34

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 1



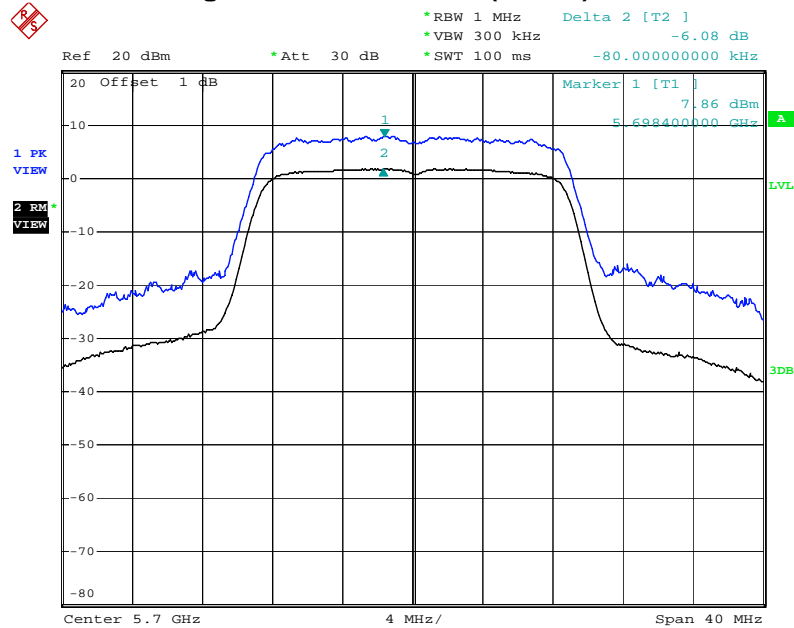
Date: 25.APR.2012 22:24:36

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 1



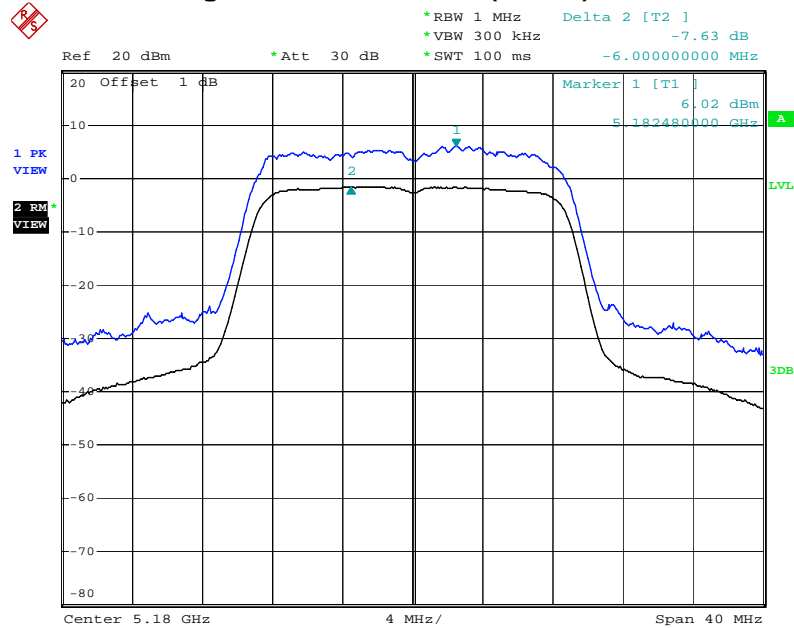
Date: 25.APR.2012 22:26:33

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 1



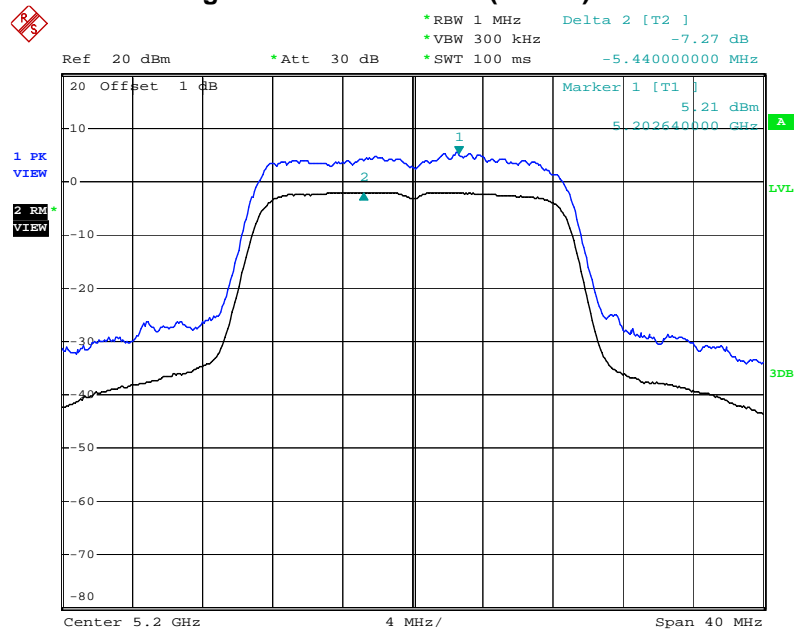
Date: 25.APR.2012 22:28:42

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5180 MHz Port 2



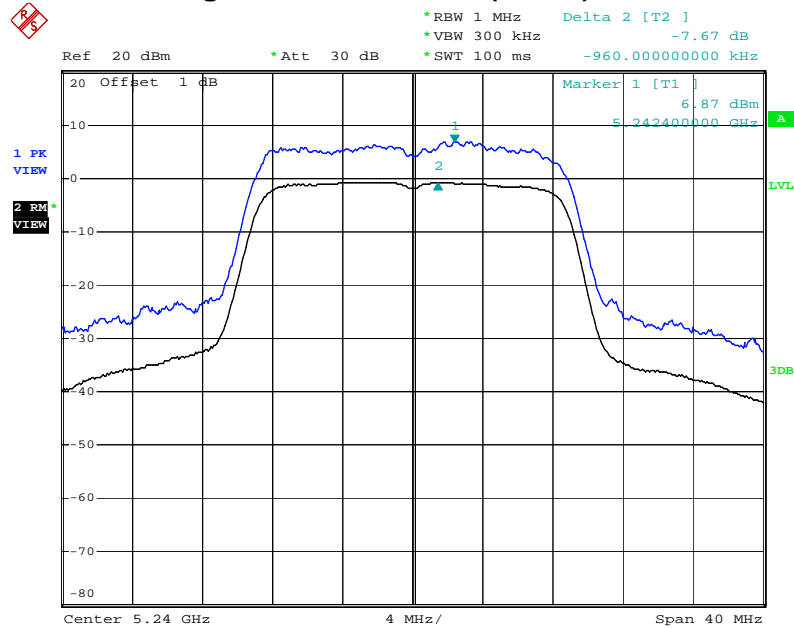
Date: 25.APR.2012 22:50:46

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5200 MHz Port 2



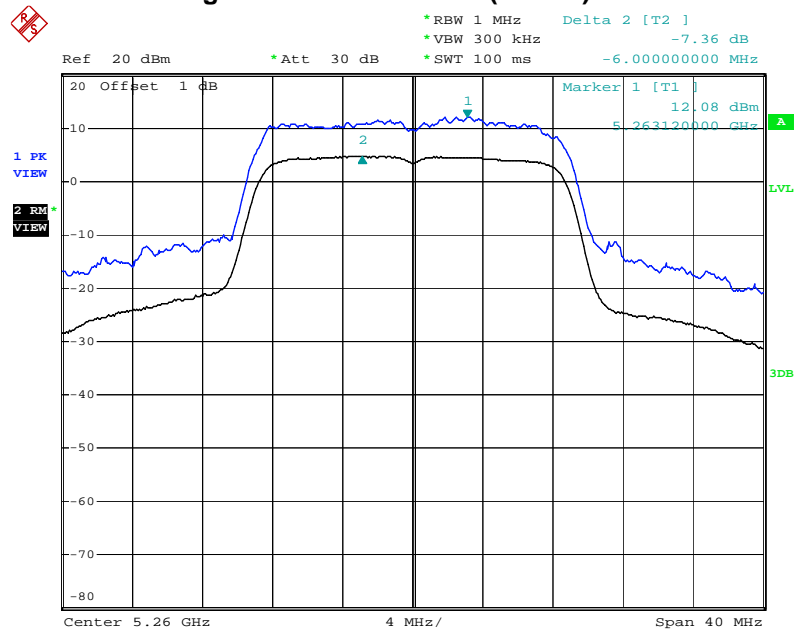
Date: 25.APR.2012 22:53:26

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5240 MHz Port 2



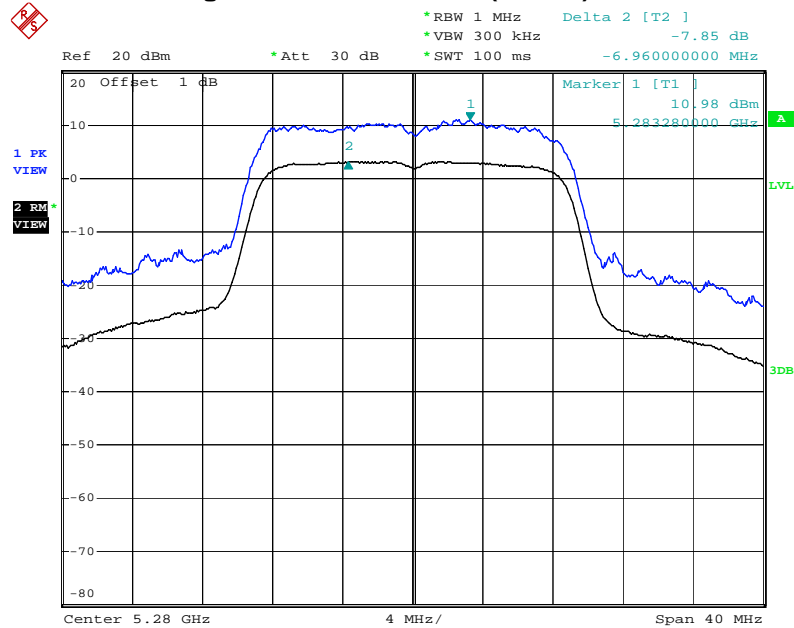
Date: 25.APR.2012 22:56:41

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5260 MHz Port 2



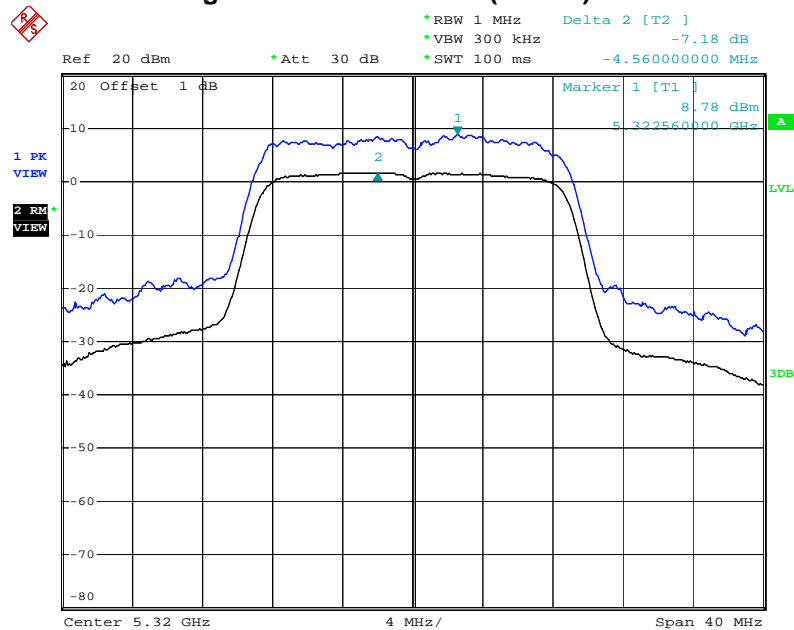
Date: 25.APR.2012 22:59:49

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5280 MHz Port 2



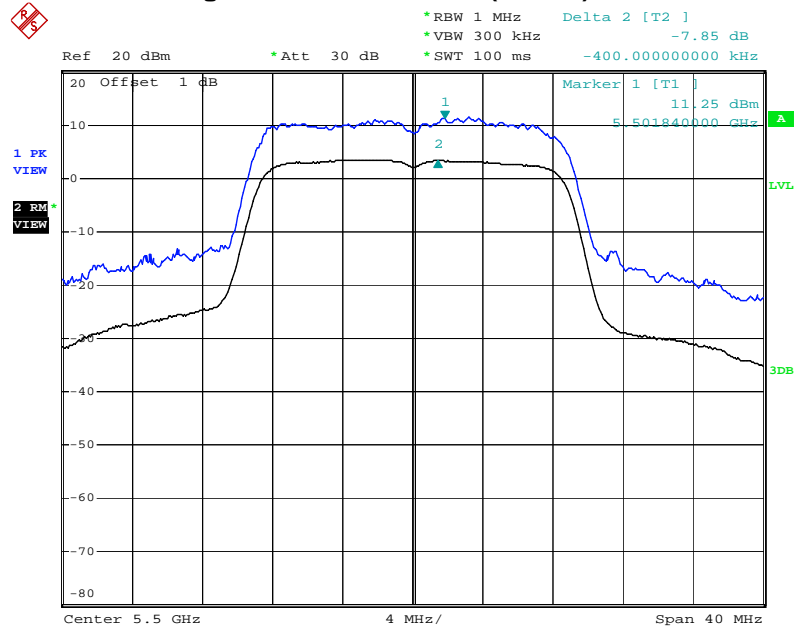
Date: 25.APR.2012 23:02:22

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5320 MHz Port 2



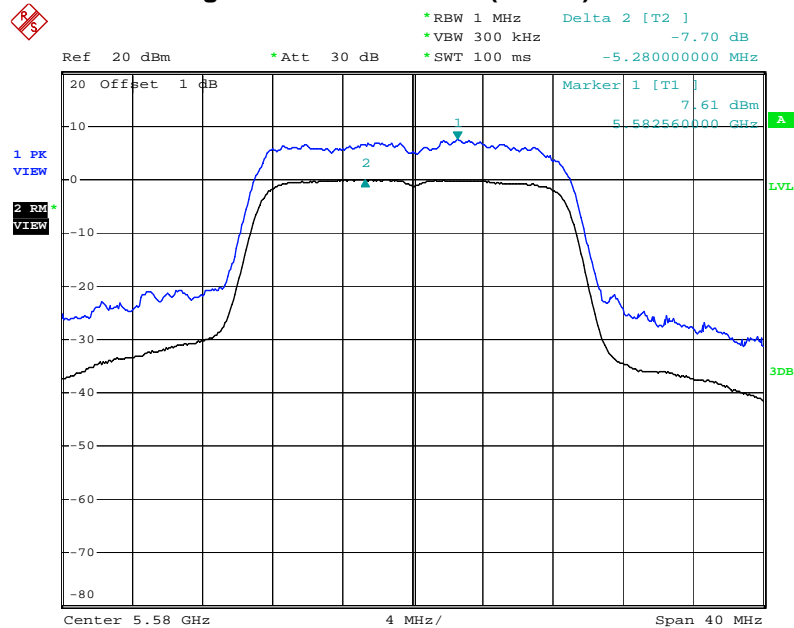
Date: 25.APR.2012 23:05:05

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5500 MHz Port 2



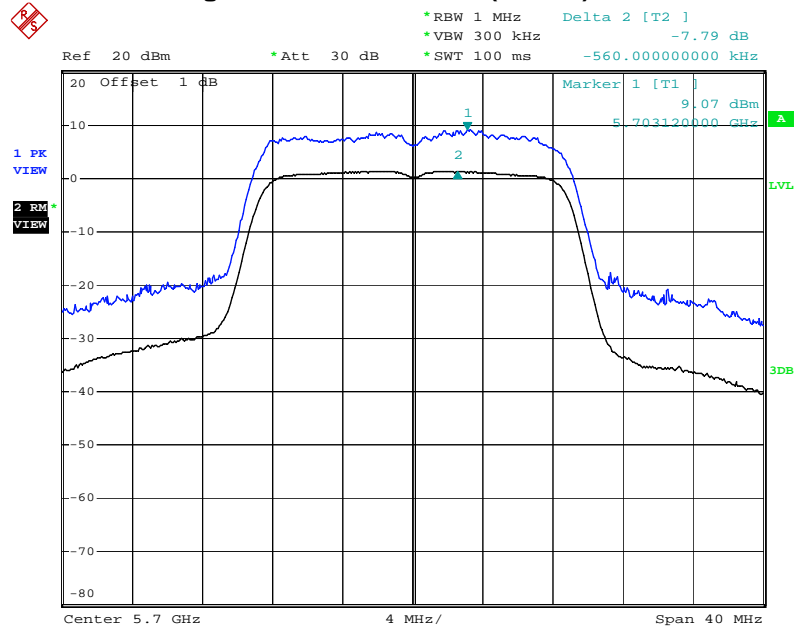
Date: 25.APR.2012 23:07:27

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5580 MHz Port 2



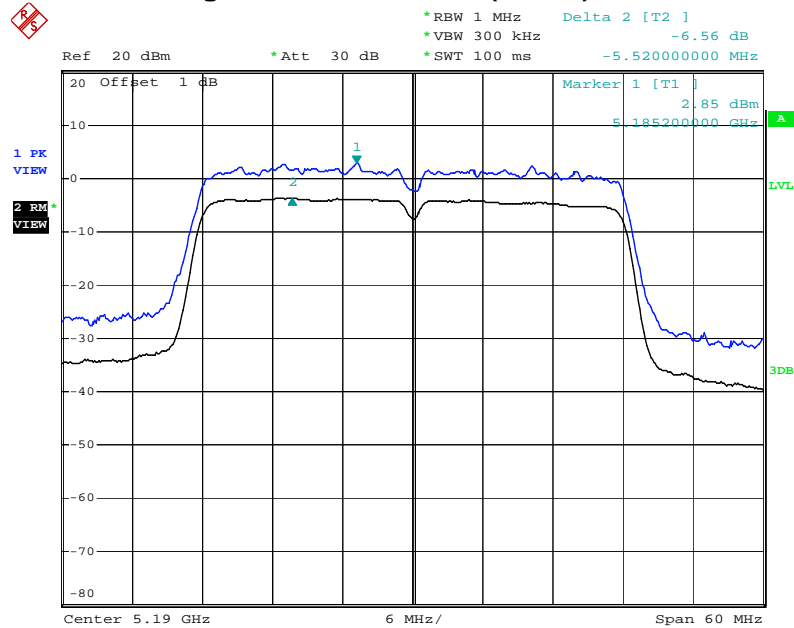
Date: 25.APR.2012 23:10:12

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) 5700 MHz Port 2



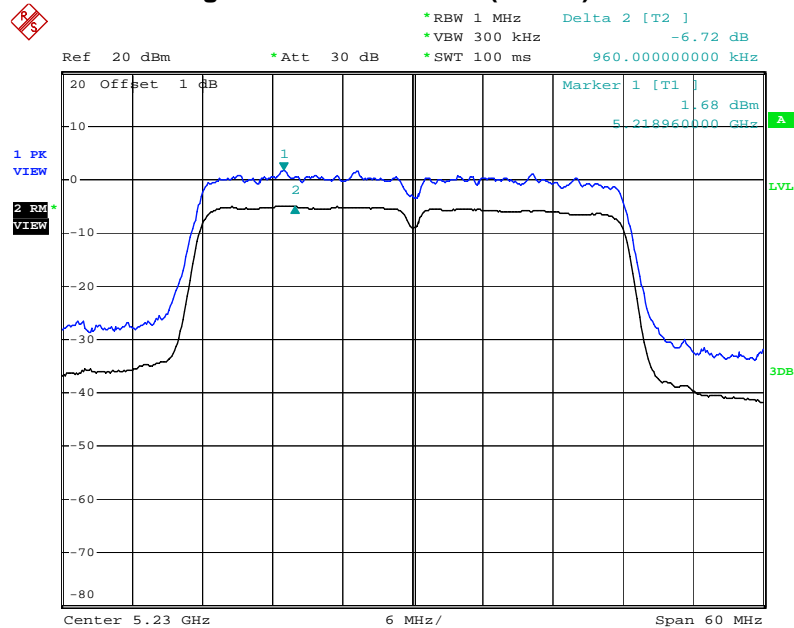
Date: 25.APR.2012 23:12:13

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 1



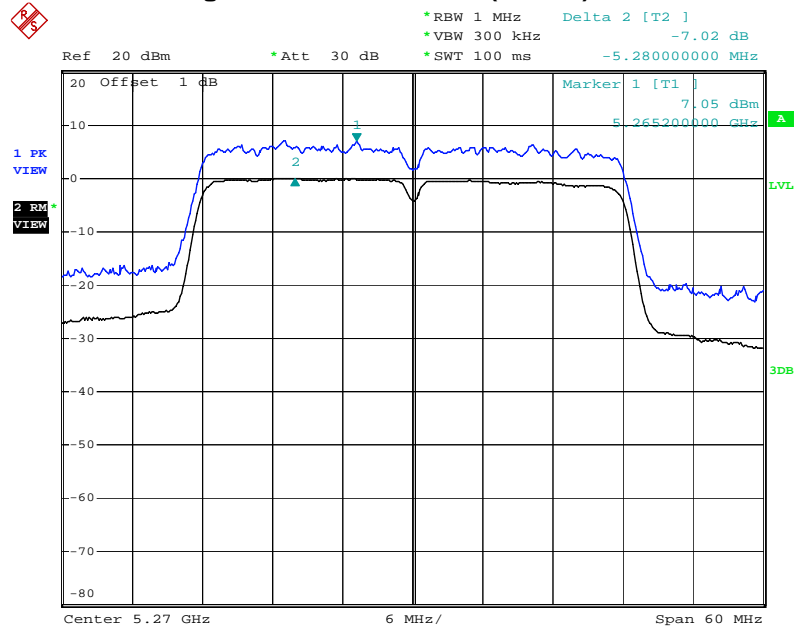
Date: 25.APR.2012 22:30:53

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 1



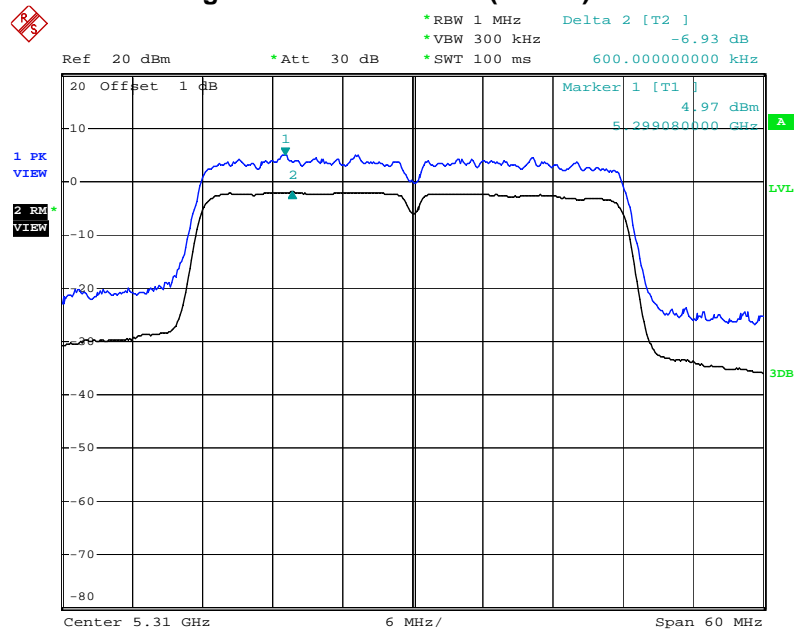
Date: 25.APR.2012 22:33:03

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 1



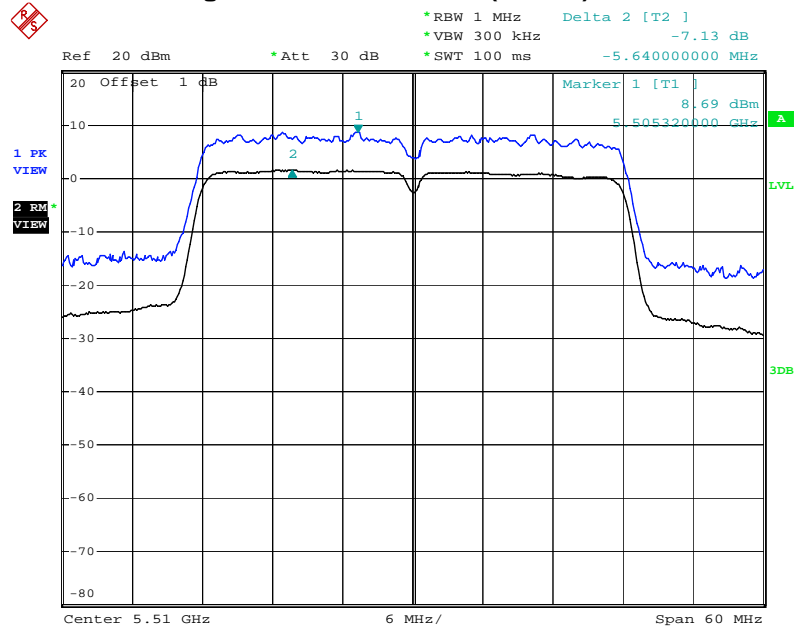
Date: 25.APR.2012 22:35:07

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 1



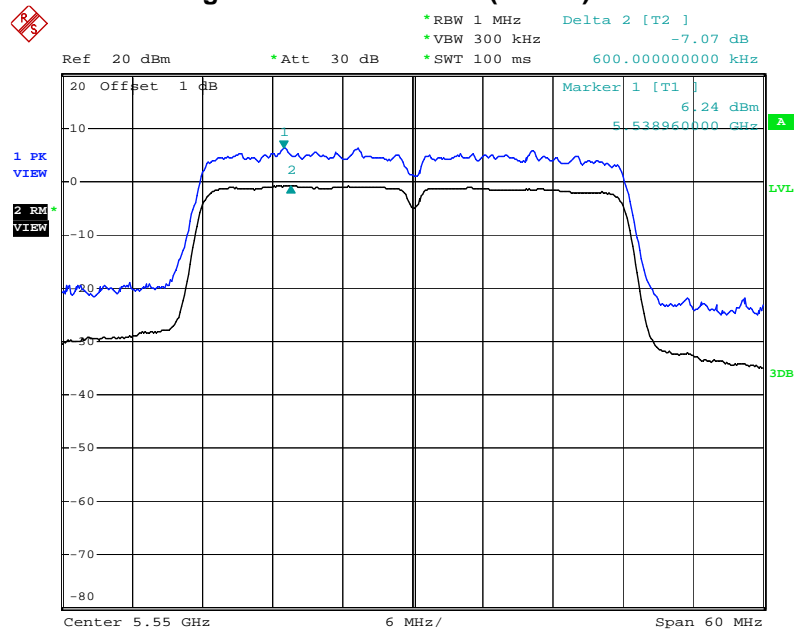
Date: 25.APR.2012 22:37:14

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 1



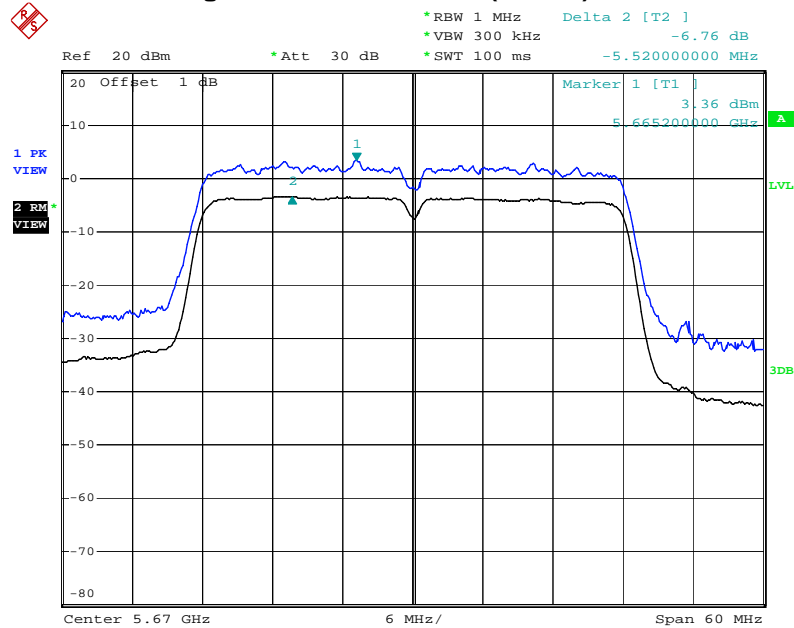
Date: 25.APR.2012 22:39:56

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 1



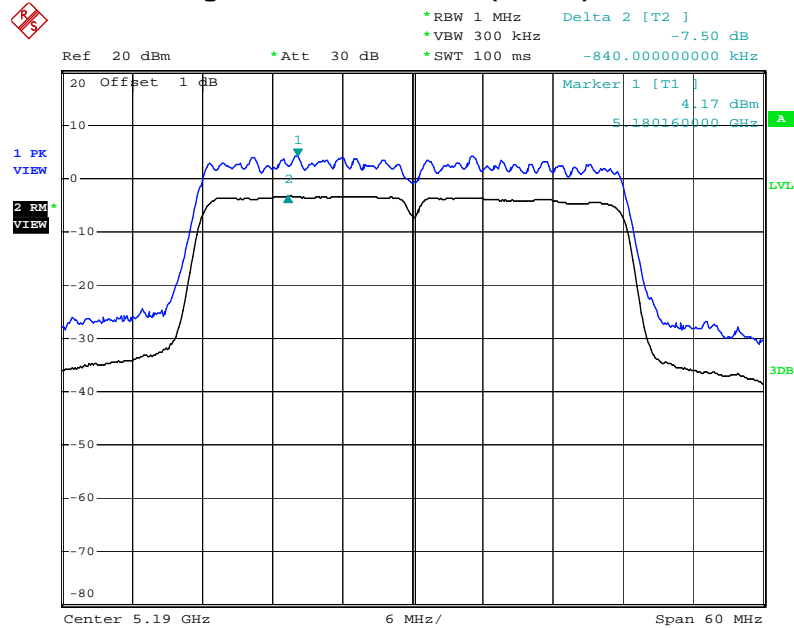
Date: 25.APR.2012 22:42:16

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 1



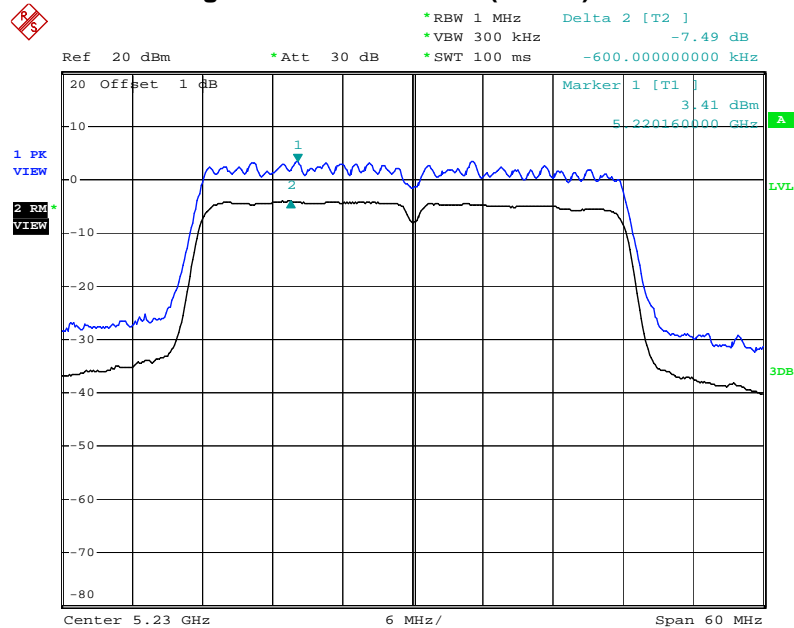
Date: 25.APR.2012 22:46:33

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5190 MHz Port 2



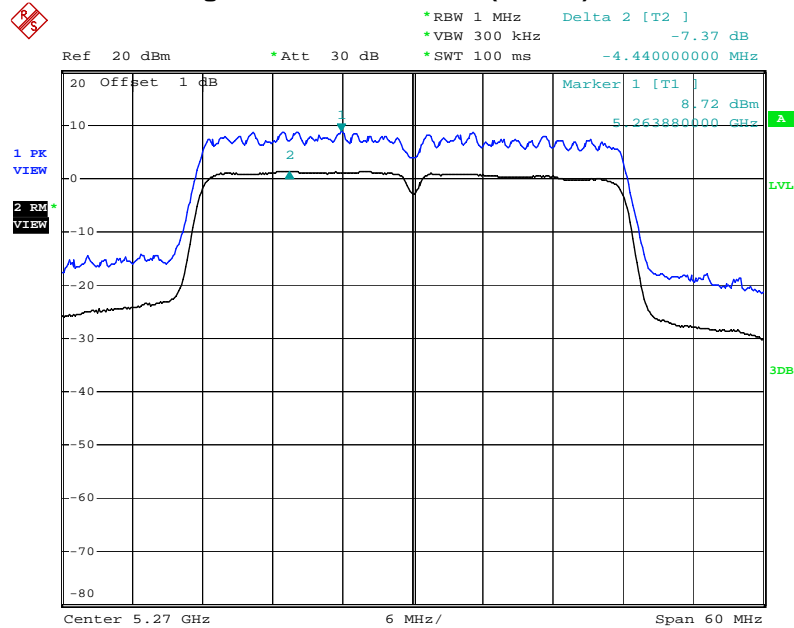
Date: 25.APR.2012 23:14:38

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5230 MHz Port 2



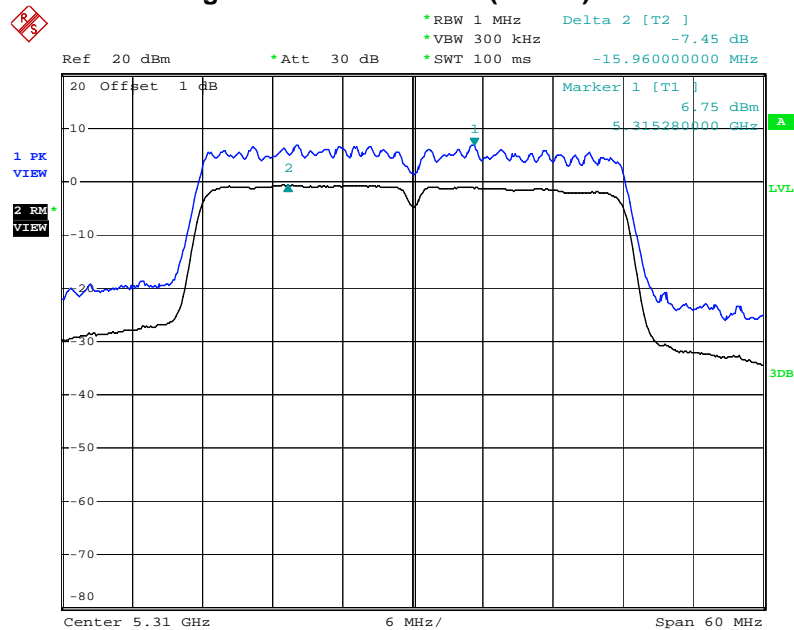
Date: 25.APR.2012 23:17:06

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5270 MHz Port 2



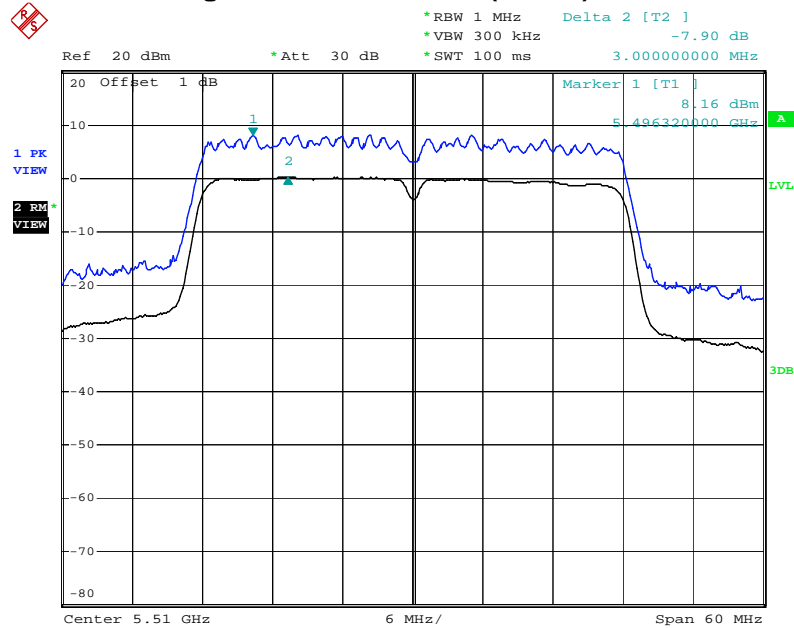
Date: 25.APR.2012 23:18:50

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5310 MHz Port 2



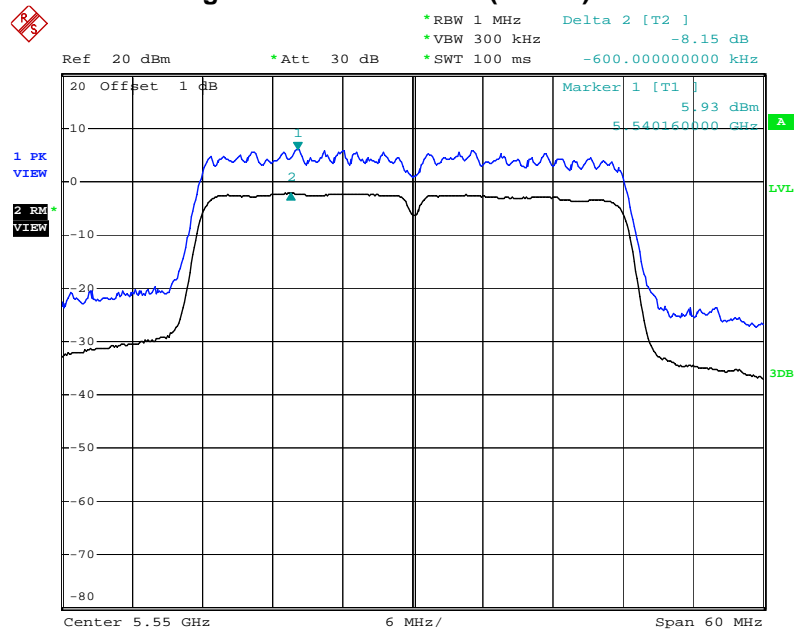
Date: 25.APR.2012 23:21:04

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5510 MHz Port 2



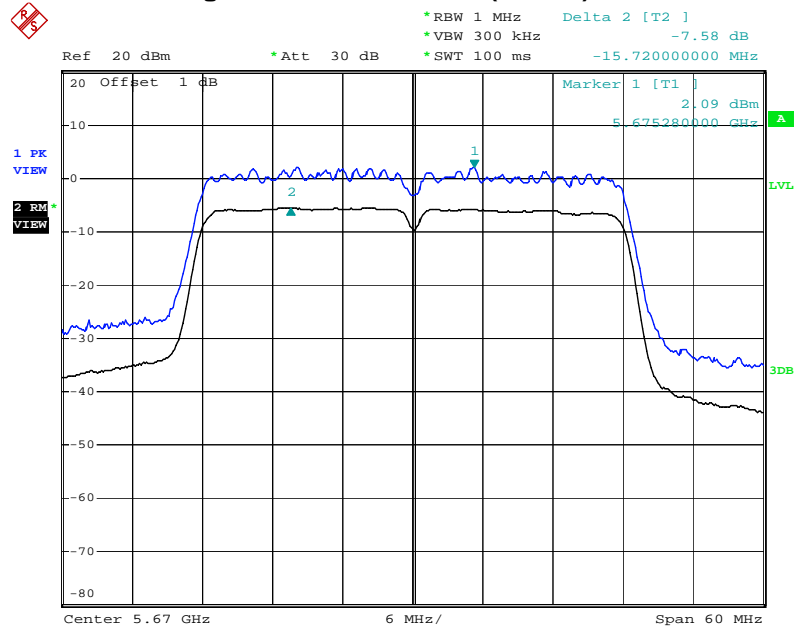
Date: 25.APR.2012 23:23:09

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5550 MHz Port 2



Date: 25.APR.2012 23:25:13

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) 5670 MHz Port 2



Date: 25.APR.2012 23:27:07

3.6 Radiated Emissions Measurement

3.6.1 Limit

For transmitters operating in the 5.15~5.25 GHz band: all emissions outside of the 5.15~5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.47~5.725 GHz band: all emissions outside of the 5.47~5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.6.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz z for peak

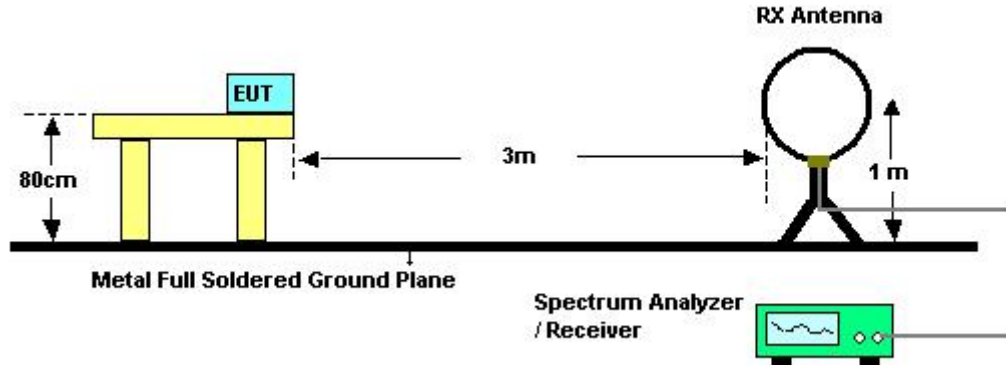
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.6.3 Test Procedures

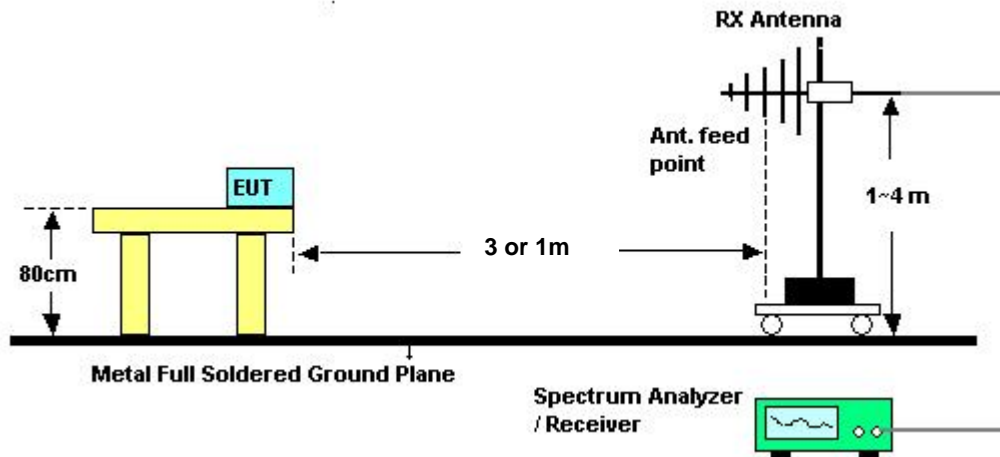
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.6.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.6.5 Test Deviation

There is no deviation with the original standard.

3.6.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7 Results of Radiated Emissions (9kHz~30MHz)

Final Test Date	Apr. 11, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	63%
Test Engineer	Streak		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

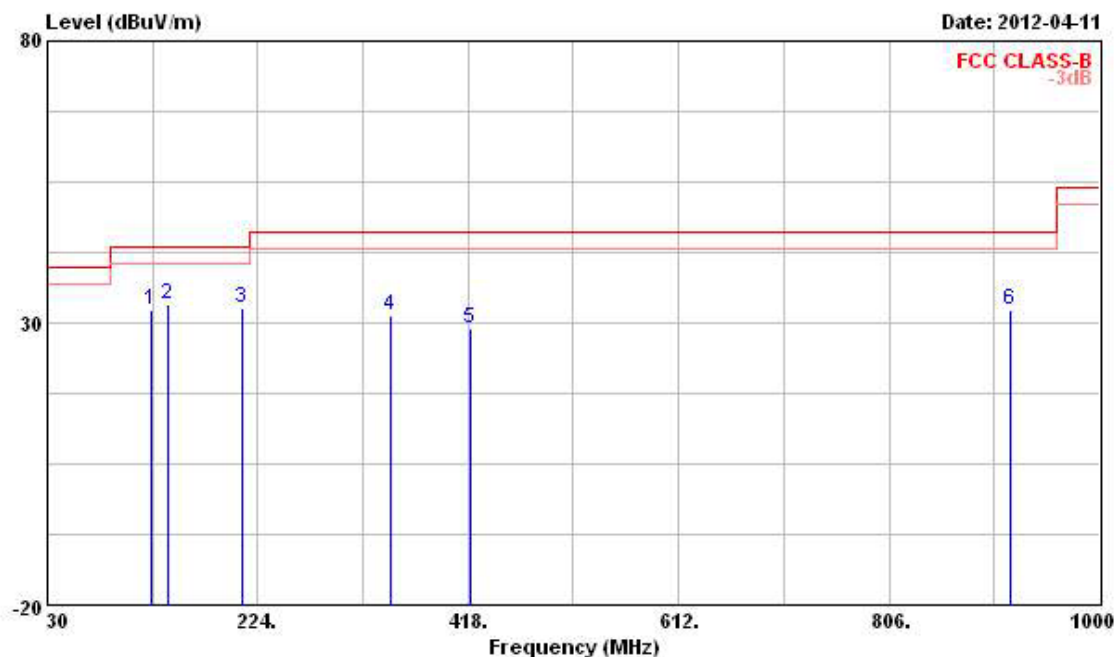
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

3.6.8 Results of Radiated Emissions (30MHz~1GHz)

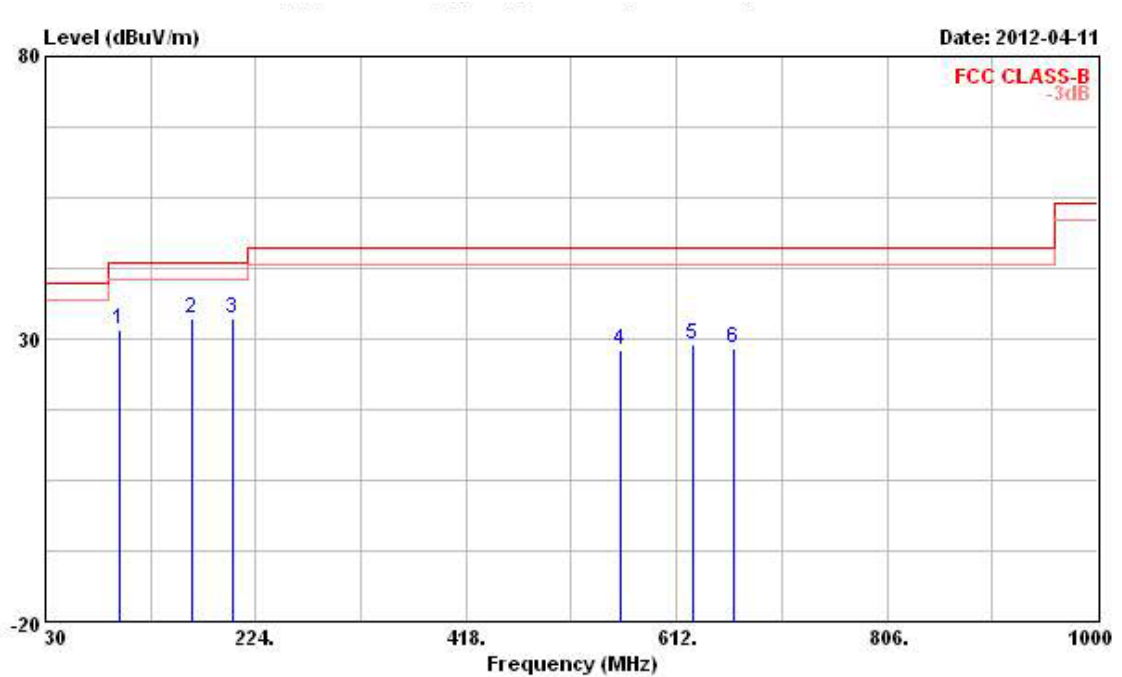
Final Test Date	Apr. 11, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	63%
Test Engineer	Streak	Configurations	System Mode

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	126.030	32.18	-11.32	43.50	44.95	13.10	1.87	27.74	Peak	---	---
2	141.550	33.13	-10.37	43.50	47.02	11.78	2.00	27.67	Peak	---	---
3	210.420	32.71	-10.79	43.50	45.89	11.70	2.50	27.38	Peak	---	---
4	347.190	31.33	-14.67	46.00	41.22	14.43	3.17	27.49	Peak	---	---
5	419.940	29.02	-16.98	46.00	37.86	15.66	3.47	27.97	Peak	---	---
6	917.550	32.15	-13.85	46.00	33.87	20.46	5.35	27.53	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	98.870	31.72	-11.78	43.50	46.91	11.01	1.65	27.85	Peak	---	---
2	164.830	33.49	-10.01	43.50	48.57	10.34	2.14	27.56	Peak	---	---
3	202.660	33.51	-9.99	43.50	47.02	11.45	2.44	27.40	Peak	---	---
4	559.620	27.98	-18.02	46.00	33.32	19.00	4.08	28.42	Peak	---	---
5	626.550	28.94	-17.06	46.00	33.20	19.83	4.32	28.41	Peak	---	---
6	664.380	28.39	-17.61	46.00	32.98	19.32	4.43	28.34	Peak	---	---

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBUV/m) = 20 log Emission level (uV/m).

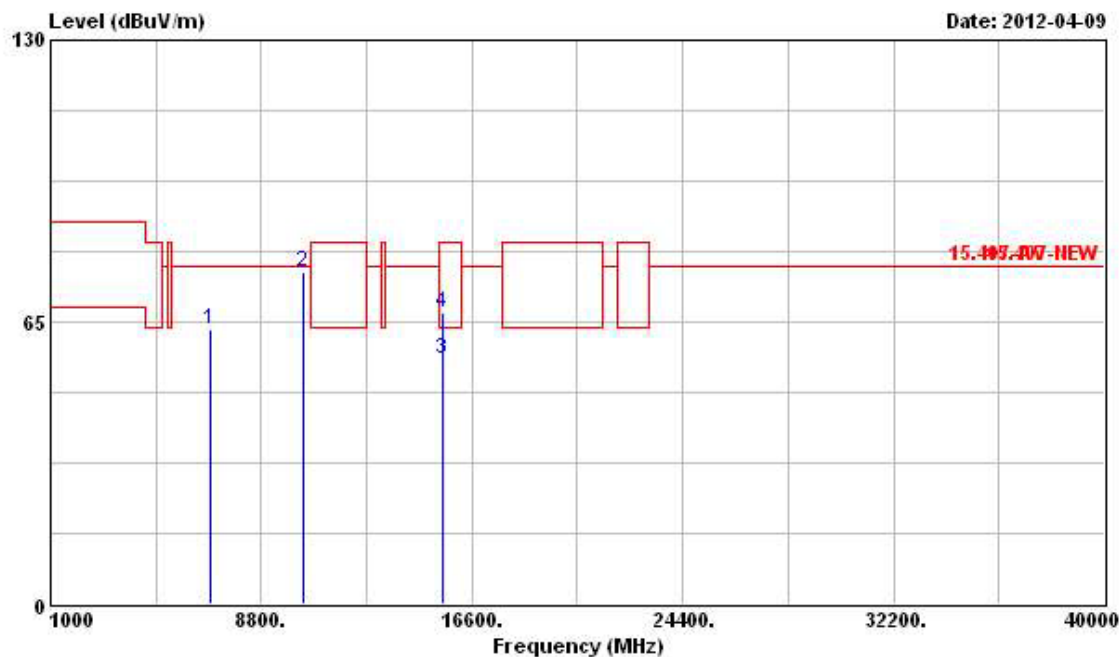
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.9 Results for Radiated Emissions (1GHz~40GHz)

For Single Chain:

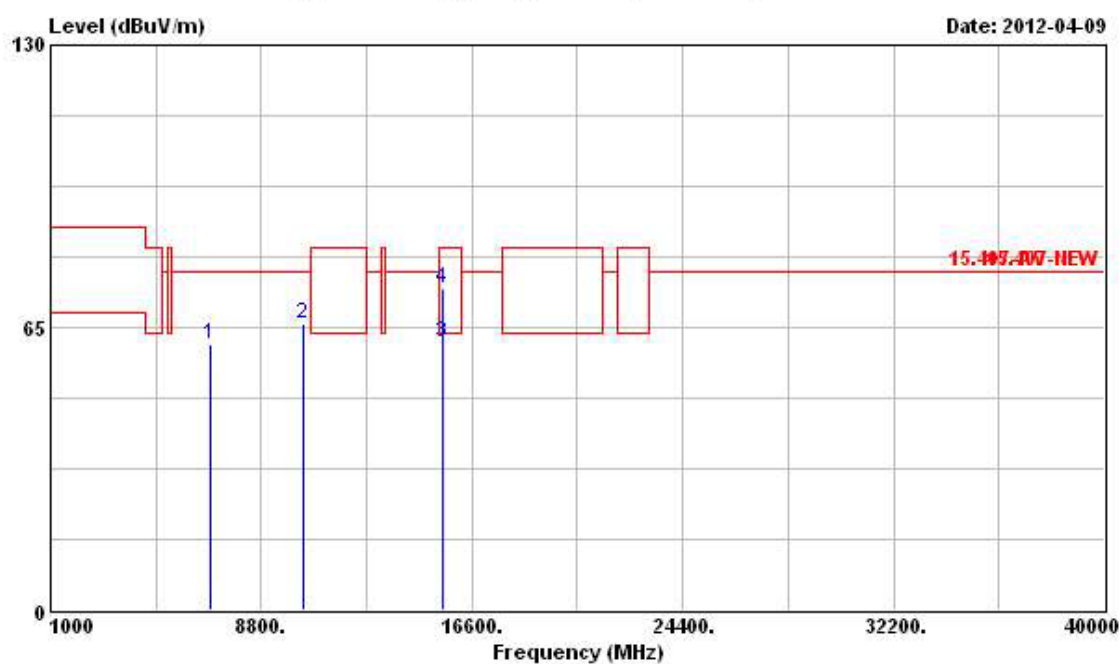
Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 36

Horizontal



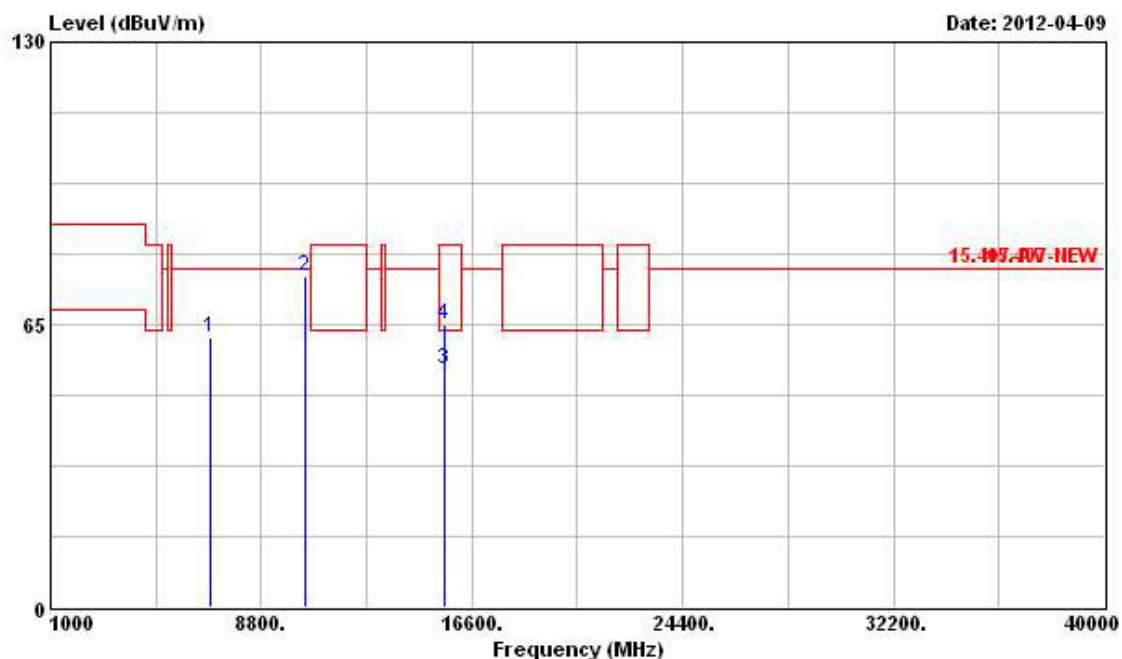
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6888.000	63.19	-14.65	77.84	56.76	35.85	5.57	34.99	Peak	---	---
2	10360.000	76.63	-1.21	77.84	66.92	38.22	6.71	35.22	Peak	---	---
3	15540.000	56.27	-7.27	63.54	42.04	40.81	8.45	35.03	Average	---	---
4	15540.000	66.93	-16.61	83.54	52.70	40.81	8.45	35.03	Peak	---	---

Vertical



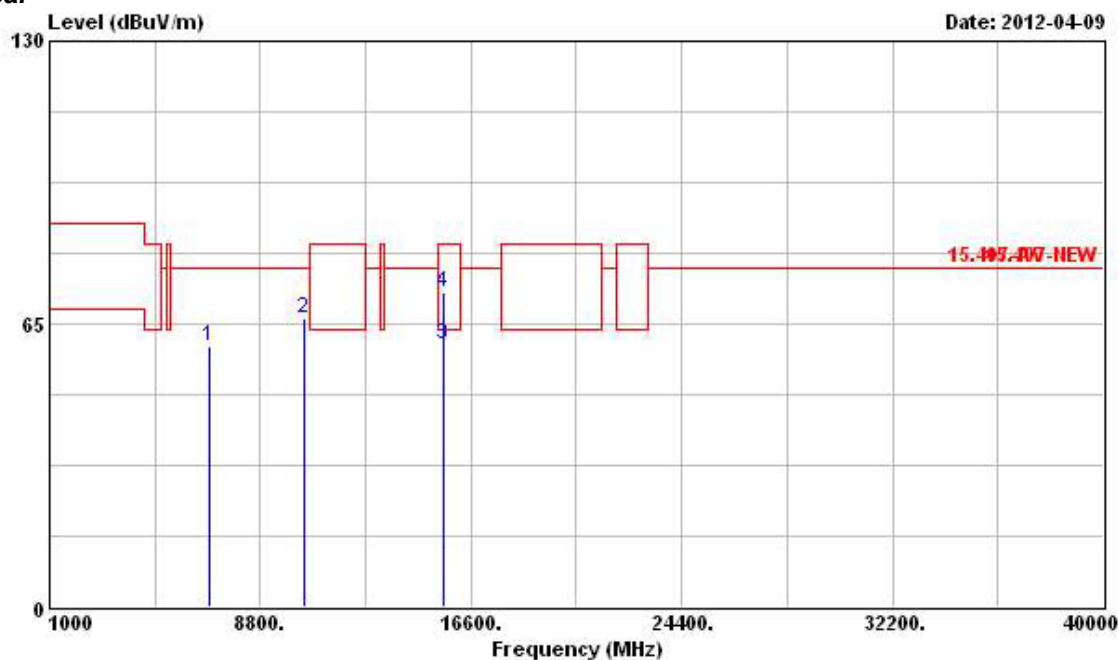
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6888.000	61.25	-16.59	77.84	54.82	35.85	5.57	34.99	Peak	---	---
2	10360.000	65.69	-12.15	77.84	55.98	38.22	6.71	35.22	Peak	---	---
3	15540.000	61.53	-2.01	63.54	47.30	40.81	8.45	35.03	Average	---	---
4	15540.000	73.95	-9.59	83.54	59.72	40.81	8.45	35.03	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 40

Horizontal

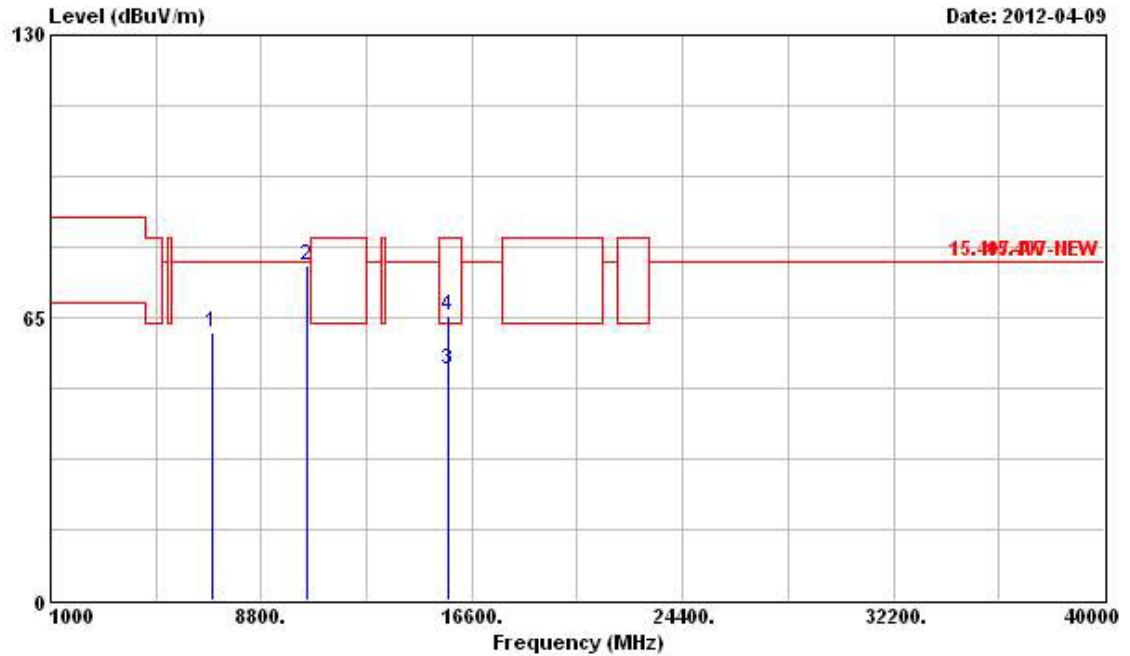
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6912.000	61.86	-15.98	77.84	55.41	35.87	5.58	35.00	Peak	---	---
2	10400.000	75.96	-1.88	77.84	66.15	38.24	6.75	35.18	Peak	---	---
3	15600.000	54.61	-8.93	63.54	40.42	40.84	8.45	35.10	Average	---	---
4	15600.000	65.10	-18.44	83.54	50.91	40.84	8.45	35.10	Peak	---	---

Vertical



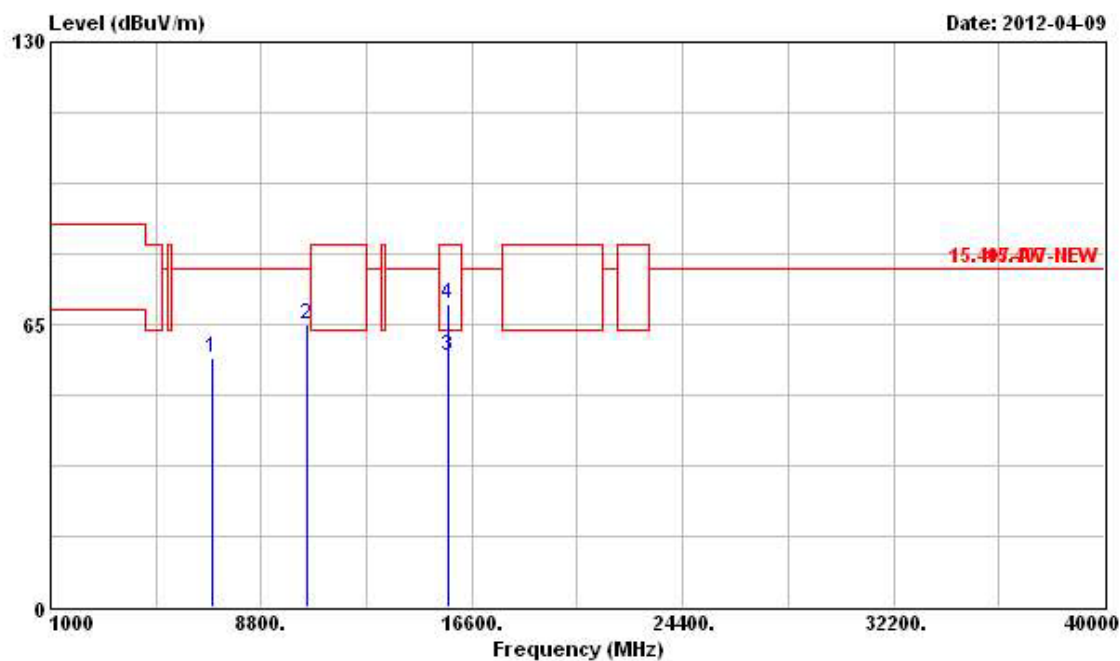
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6912.000	59.81	-18.03	77.84	53.36	35.87	5.58	35.00	Peak	---	---
2	10400.000	66.22	-11.62	77.84	56.41	38.24	6.75	35.18	Peak	---	---
3	15600.000	60.08	-3.46	63.54	45.89	40.84	8.45	35.10	Average	---	---
4	15600.000	72.13	-11.41	83.54	57.94	40.84	8.45	35.10	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 48

Horizontal

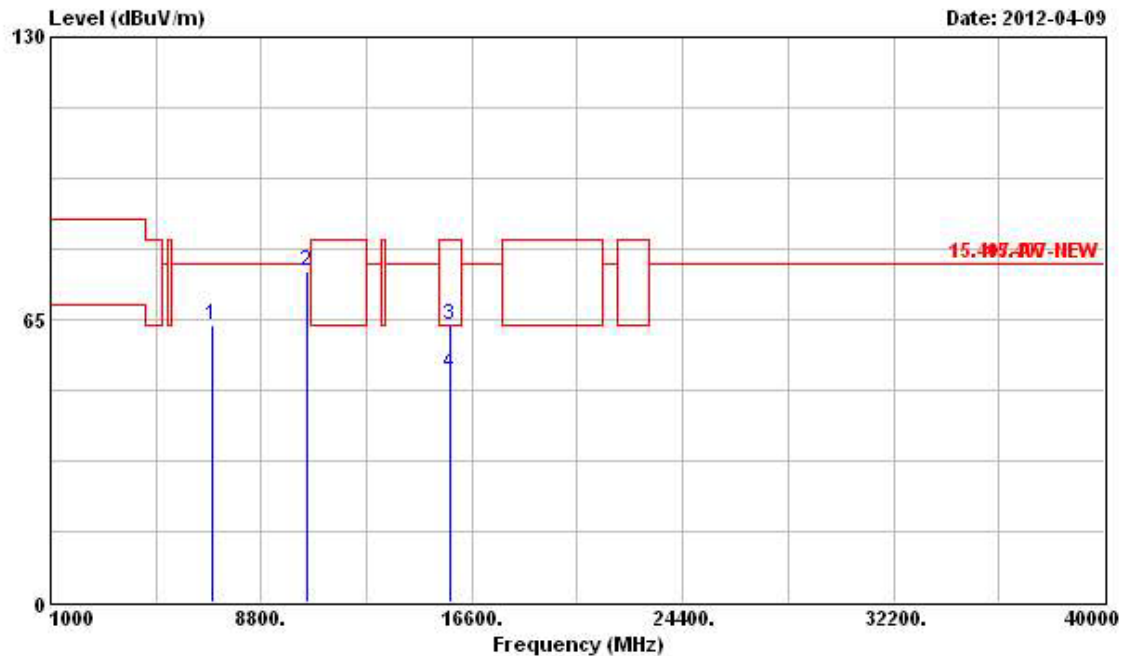
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6984.000	61.41	-16.43	77.84	54.95	35.89	5.59	35.02	Peak	---	---
2	10480.000	76.82	-1.02	77.84	66.83	38.29	6.82	35.12	Peak	---	---
3	15720.000	53.14	-10.40	63.54	38.99	40.89	8.46	35.20	Average	---	---
4	15720.000	65.26	-18.28	83.54	51.11	40.89	8.46	35.20	Peak	---	---

Vertical



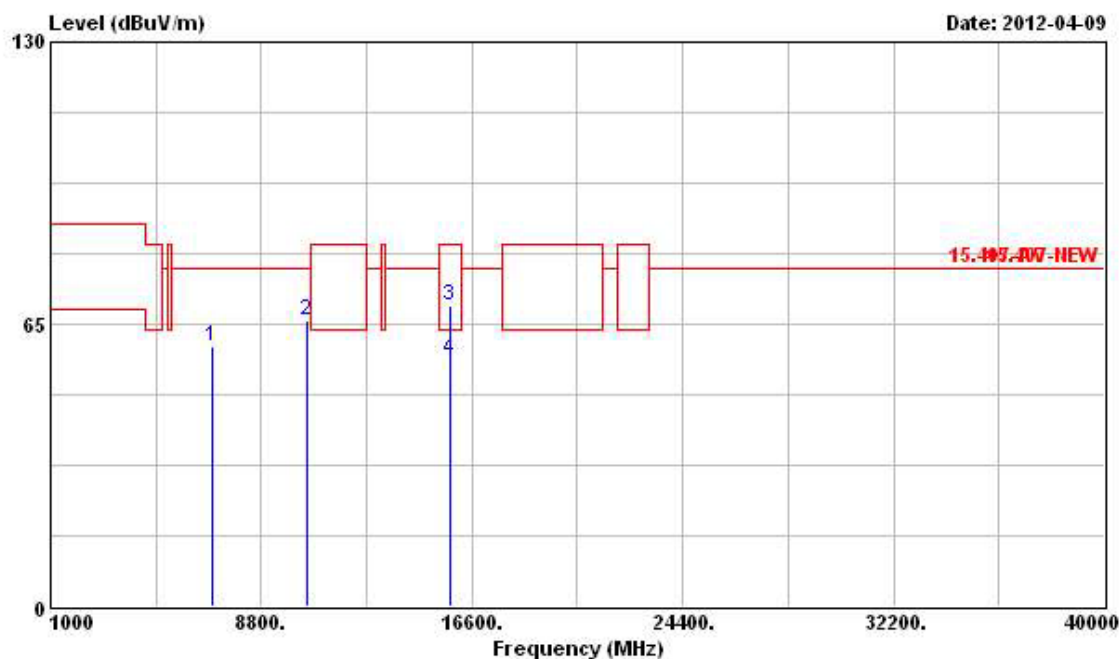
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6984.000	57.37	-20.47	77.84	50.91	35.89	5.59	35.02	Peak	---	---
2	10480.000	65.09	-12.75	77.84	55.10	38.29	6.82	35.12	Peak	---	---
3	15720.000	57.63	-5.91	63.54	43.48	40.89	8.46	35.20	Average	---	---
4	15720.000	69.70	-13.84	83.54	55.55	40.89	8.46	35.20	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 52

Horizontal

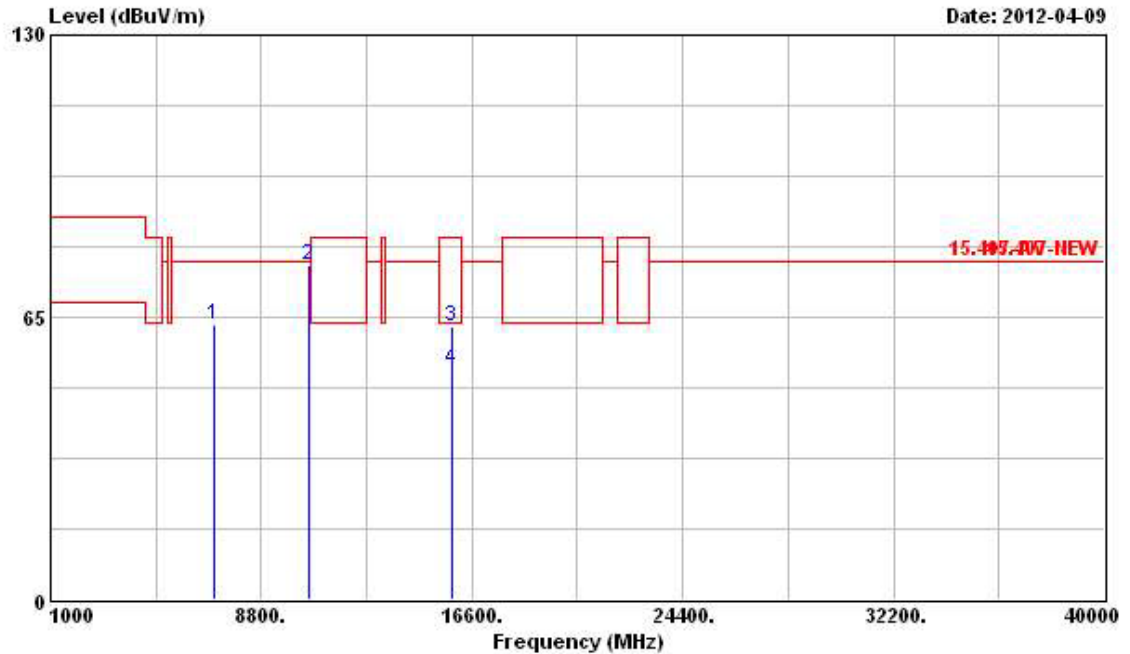
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	63.82	-14.02	77.84	57.34	35.90	5.60	35.02	Peak	---	---
2	10520.000	76.24	-1.60	77.84	66.18	38.31	6.85	35.10	Peak	---	---
3	15780.000	63.81	-19.73	83.54	49.72	40.91	8.46	35.28	Peak	---	---
4	15780.000	52.53	-11.01	63.54	38.44	40.91	8.46	35.28	Average	---	---

Vertical



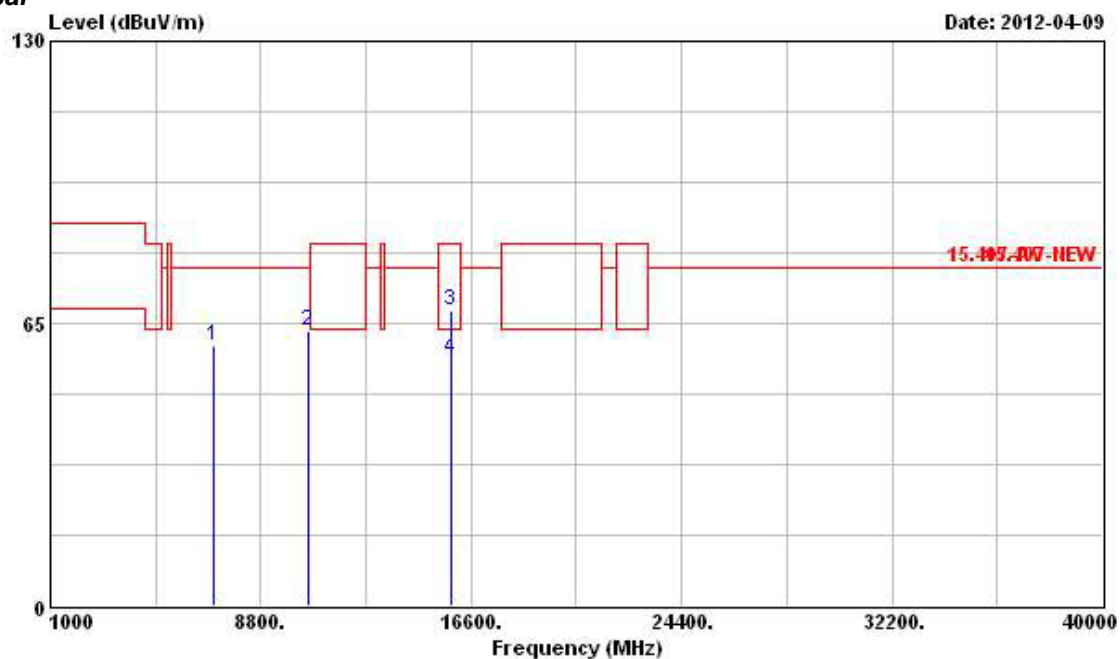
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	59.93	-17.91	77.84	53.45	35.90	5.60	35.02	Peak	---	---
2	10520.000	65.70	-12.14	77.84	55.64	38.31	6.85	35.10	Peak	---	---
3	15780.000	69.45	-14.09	83.54	55.36	40.91	8.46	35.28	Peak	---	---
4	15780.000	56.93	-6.61	63.54	42.84	40.91	8.46	35.28	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 56

Horizontal

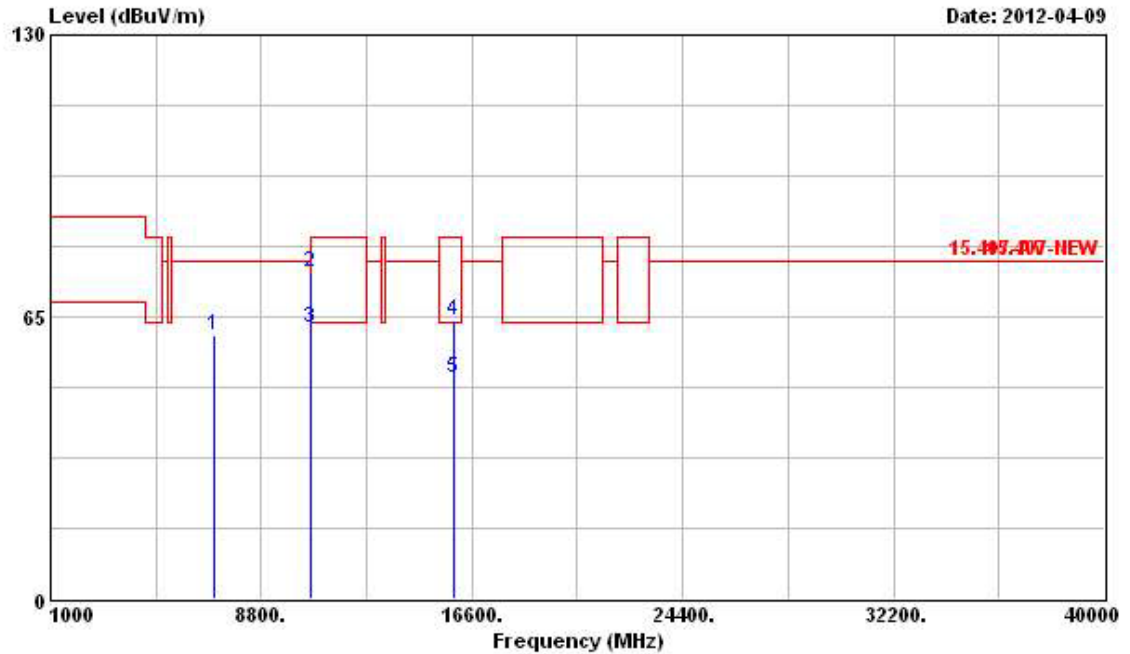
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7032.000	63.11	-14.73	77.84	56.65	35.89	5.60	35.03	Peak	---	---
2	10560.000	76.79	-1.05	77.84	66.64	38.33	6.88	35.06	Peak	---	---
3	15840.000	62.74	-20.80	83.54	48.67	40.94	8.46	35.33	Peak	---	---
4	15840.000	52.88	-10.66	63.54	38.81	40.94	8.46	35.33	Average	---	---

Vertical



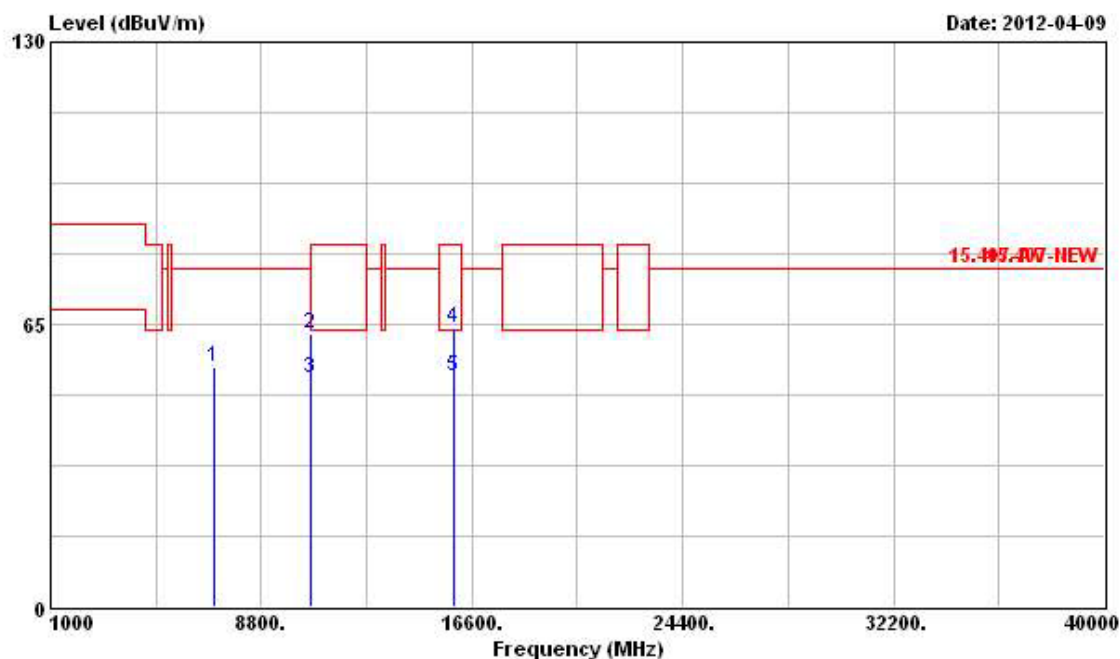
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7032.000	60.07	-17.77	77.84	53.61	35.89	5.60	35.03	Peak	---	---
2	10560.000	63.39	-14.45	77.84	53.24	38.33	6.88	35.06	Peak	---	---
3	15840.000	68.19	-15.35	83.54	54.12	40.94	8.46	35.33	Peak	---	---
4	15840.000	56.98	-6.56	63.54	42.91	40.94	8.46	35.33	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 64

Horizontal

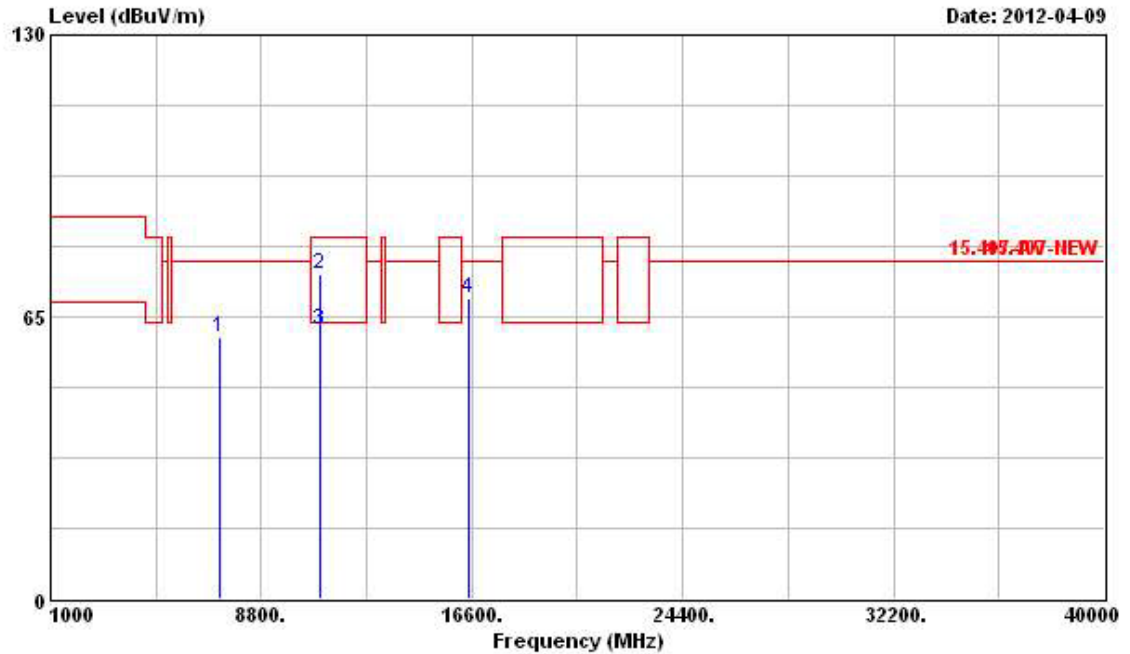
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	60.61	-17.23	77.84	54.16	35.88	5.61	35.04	Peak	---	---
2	10640.000	75.42	-8.12	83.54	65.11	38.38	6.93	35.00	Peak	---	---
3	10640.000	62.27	-1.27	63.54	51.96	38.38	6.93	35.00	Average	---	---
4	15960.000	64.03	-19.51	83.54	50.02	40.99	8.47	35.45	Peak	---	---
5	15960.000	51.05	-12.49	63.54	37.04	40.99	8.47	35.45	Average	---	---

Vertical



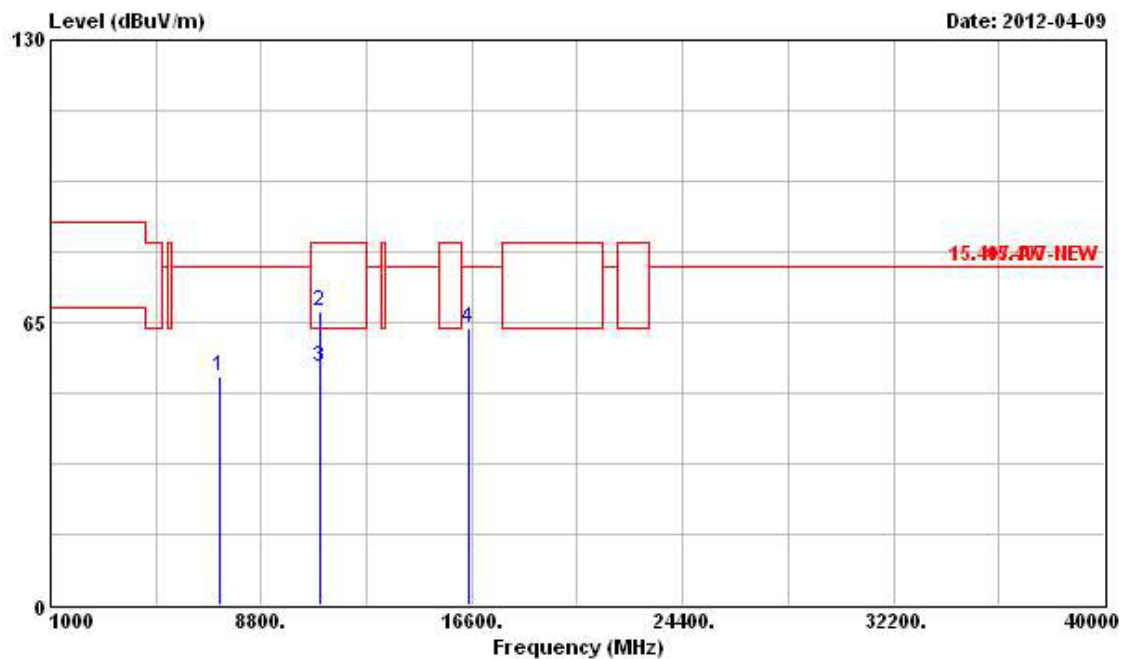
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	55.12	-22.72	77.84	48.67	35.88	5.61	35.04	Peak	---	---
2	10640.000	62.74	-20.80	83.54	52.43	38.38	6.93	35.00	Peak	---	---
3	10640.000	52.56	-10.98	63.54	42.25	38.38	6.93	35.00	Average	---	---
4	15960.000	64.31	-19.23	83.54	50.30	40.99	8.47	35.45	Peak	---	---
5	15960.000	53.17	-10.37	63.54	39.16	40.99	8.47	35.45	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 100

Horizontal

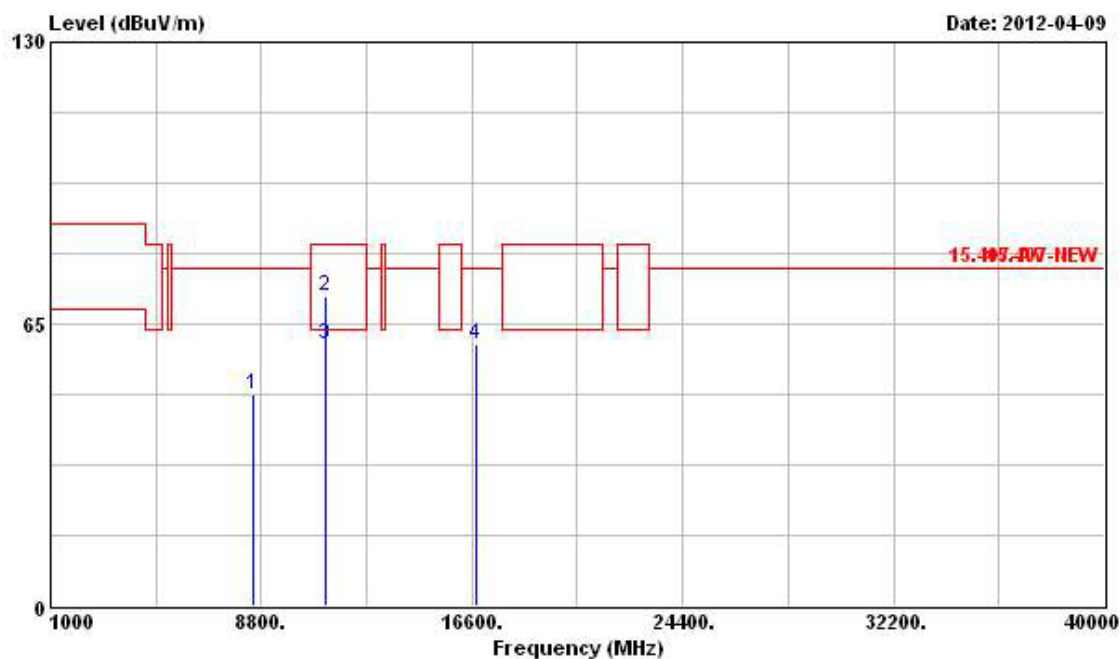
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7241.000	60.20	-17.64	77.84	53.80	35.85	5.63	35.08	Peak	---	---
2	11000.000	75.02	-8.52	83.54	63.97	38.60	7.17	34.72	Peak	---	---
3	11000.000	62.06	-1.48	63.54	51.01	38.60	7.17	34.72	Average	---	---
4	16500.000	69.24	-8.60	77.84	53.99	42.00	8.24	34.99	Peak	---	---

Vertical



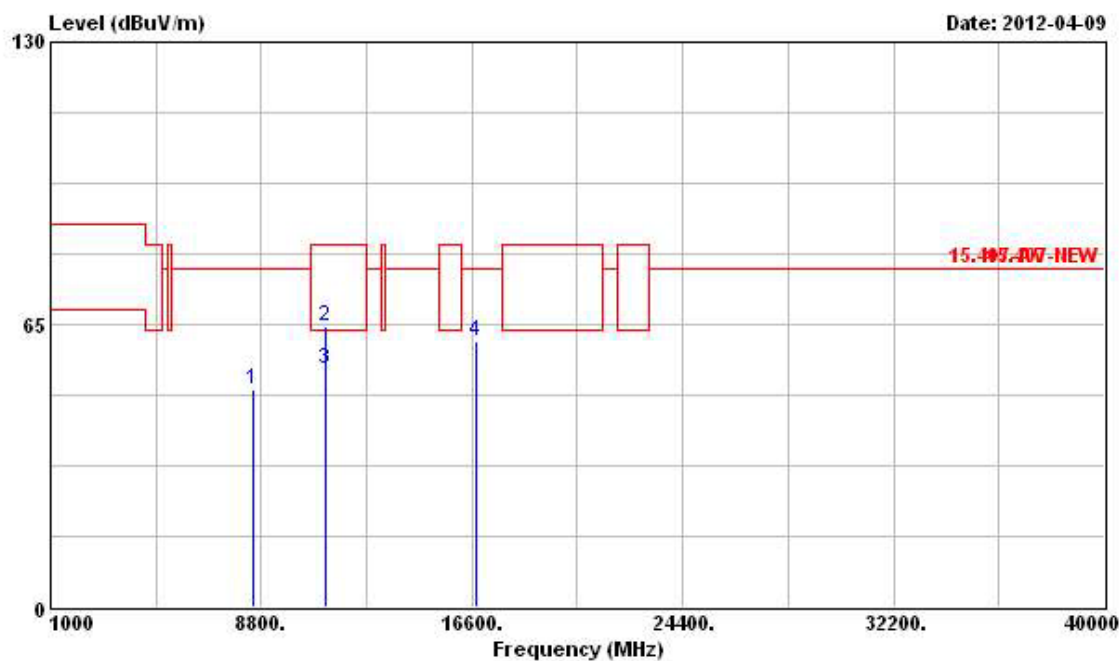
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7241.000	52.79	-25.05	77.84	46.39	35.85	5.63	35.08	Peak	---	---
2	11000.000	67.57	-15.97	83.54	56.52	38.60	7.17	34.72	Peak	---	---
3	11000.000	54.77	-8.77	63.54	43.72	38.60	7.17	34.72	Average	---	---
4	16500.000	63.64	-14.20	77.84	48.39	42.00	8.24	34.99	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 116

Horizontal

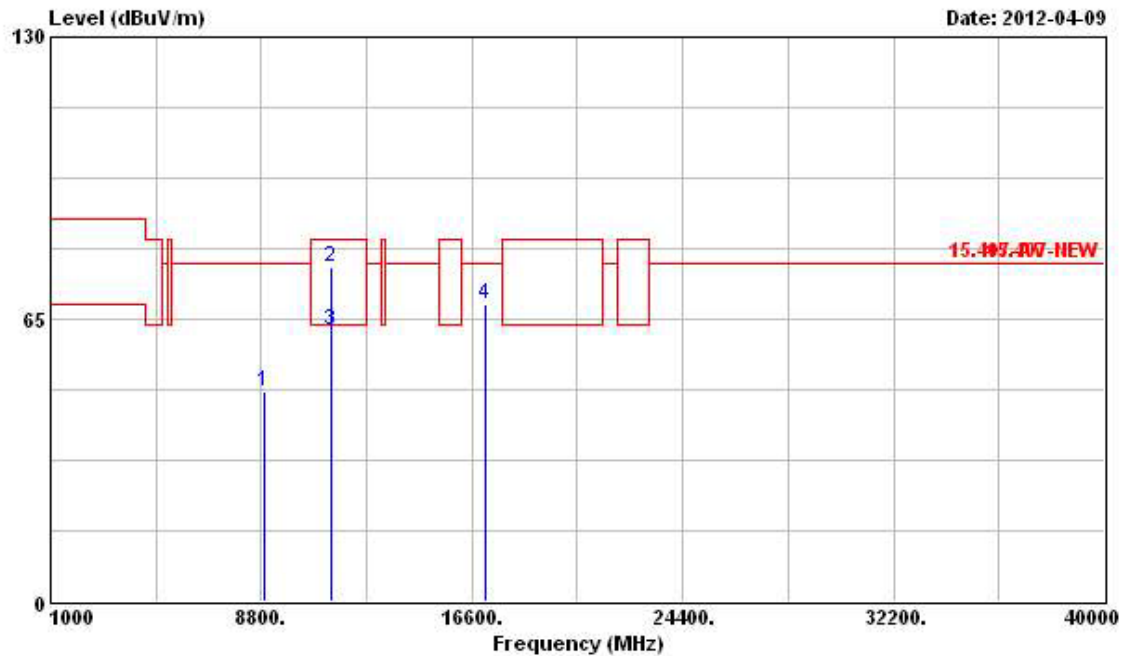
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8520.000	48.90	-28.94	77.84	41.87	36.31	5.96	35.24	Peak	---	---
2	11160.000	71.48	-12.06	83.54	60.54	38.70	6.96	34.72	Peak	---	---
3	11160.000	60.30	-3.24	63.54	49.36	38.70	6.96	34.72	Average	---	---
4	16740.000	60.19	-17.65	77.84	44.37	41.86	8.47	34.51	Peak	---	---

Vertical



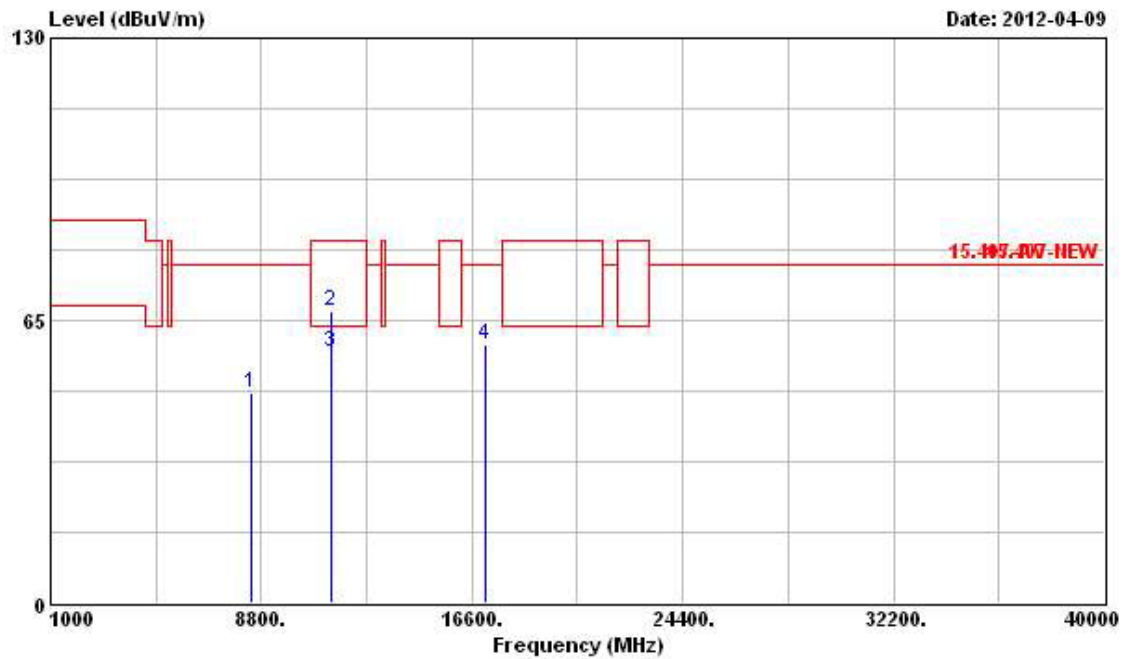
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8520.000	50.12	-27.72	77.84	43.09	36.31	5.96	35.24	Peak	---	---
2	11160.000	64.43	-19.11	83.54	53.49	38.70	6.96	34.72	Peak	---	---
3	11160.000	54.59	-8.95	63.54	43.65	38.70	6.96	34.72	Average	---	---
4	16740.000	60.97	-16.87	77.84	45.15	41.86	8.47	34.51	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 140

Horizontal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8904.000	48.36	-29.48	77.84	40.99	36.54	6.13	35.30	Peak	---	---
2	11400.000	76.80	-6.74	83.54	65.97	38.84	6.71	34.72	Peak	---	---
3	11400.000	62.39	-1.15	63.54	51.56	38.84	6.71	34.72	Average	---	---
4	17100.000	68.34	-9.50	77.84	52.05	41.66	8.61	33.98	Peak	---	---

Vertical

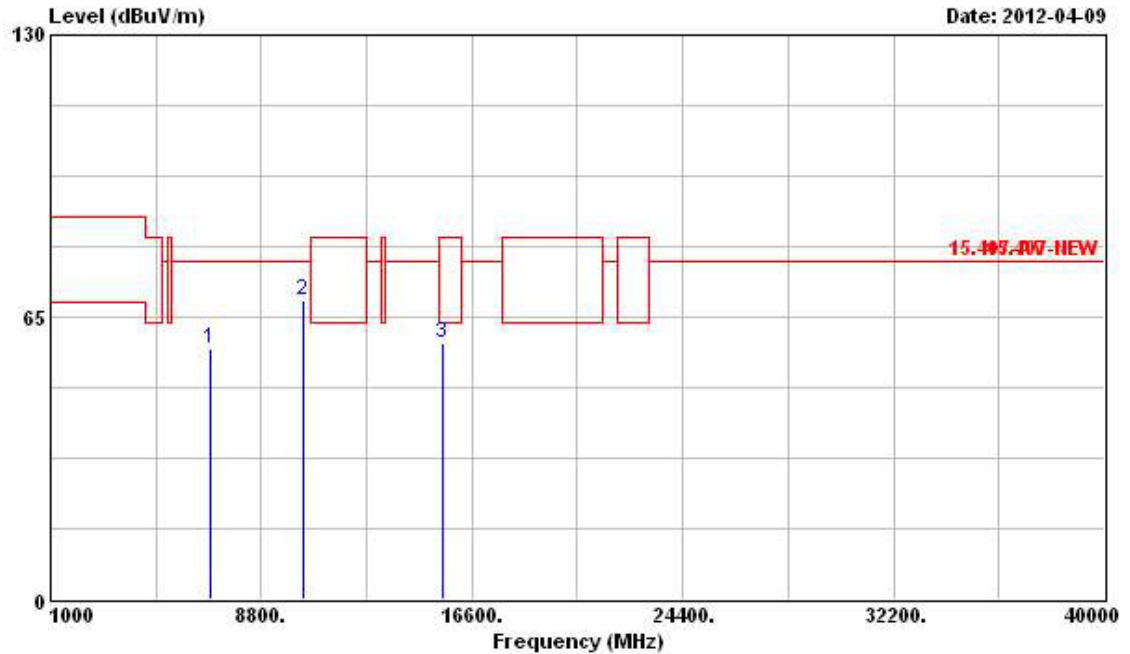


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8436.000	48.41	-29.43	77.84	41.48	36.24	5.93	35.24	PK	---	---
2	11400.000	66.93	-16.61	83.54	56.10	38.84	6.71	34.72	Peak	---	---
3	11400.000	57.85	-5.69	63.54	47.02	38.84	6.71	34.72	Average	---	---
4	17100.000	59.52	-18.32	77.84	43.23	41.66	8.61	33.98	Peak	---	---

For Two Chains:

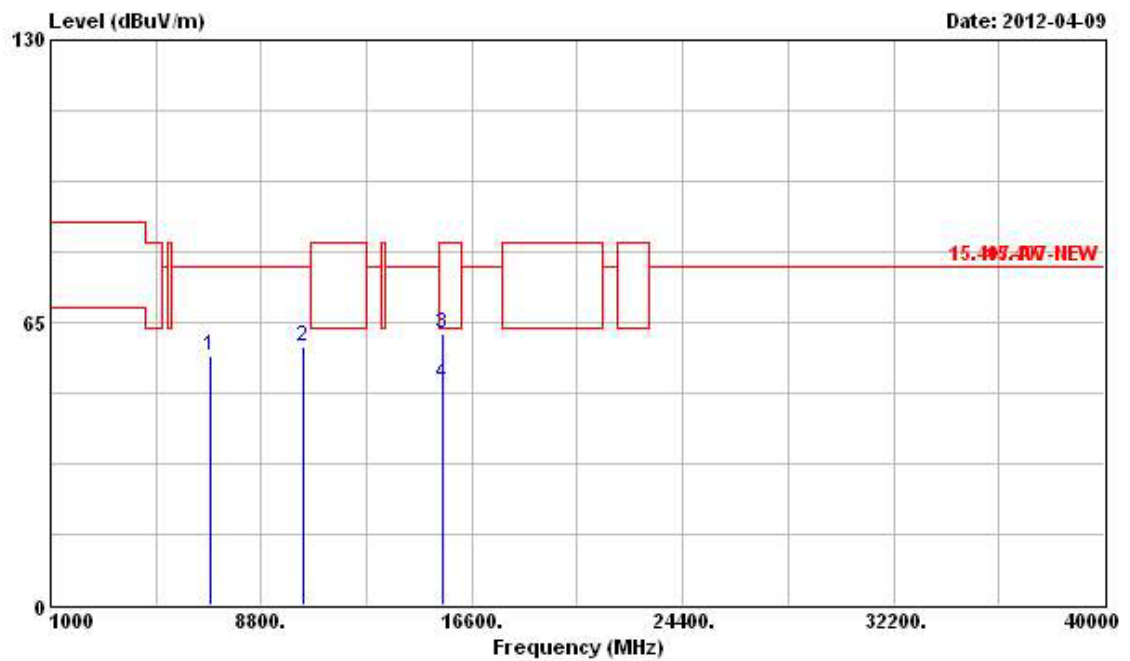
Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 36 (20MHz)

Horizontal



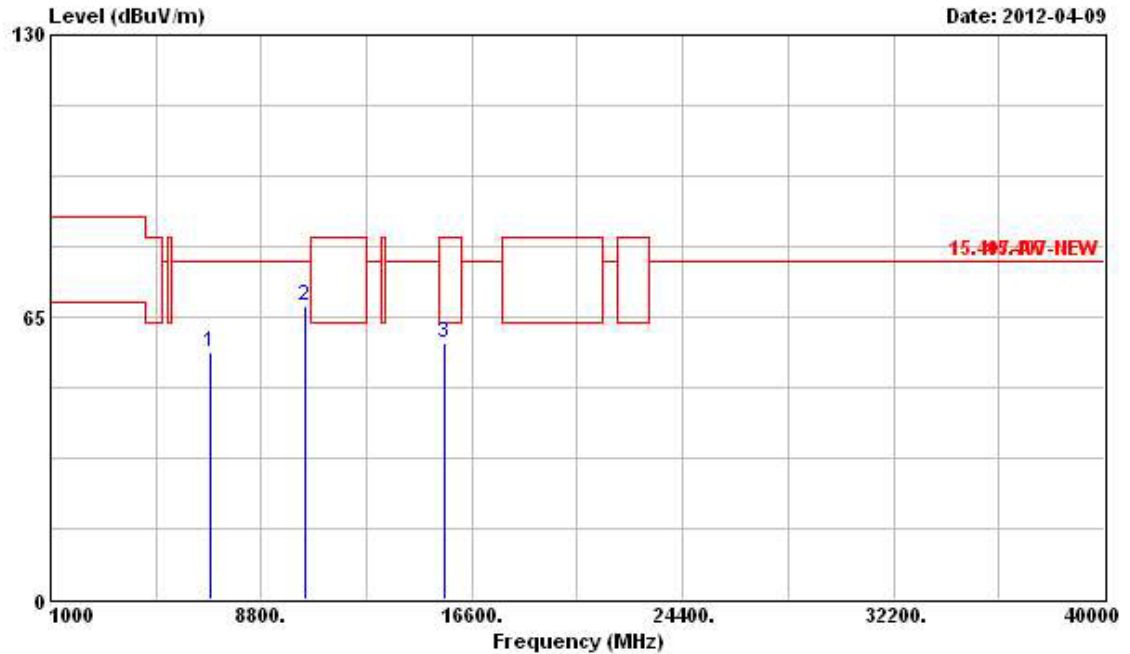
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6888.000	57.60	-20.24	77.84	51.17	35.85	5.57	34.99	Peak	---	---
2	10360.000	68.80	-9.04	77.84	59.09	38.22	6.71	35.22	Peak	---	---
3	15540.000	59.15	-4.39	63.54	44.92	40.81	8.45	35.03	PK	---	---

Vertical



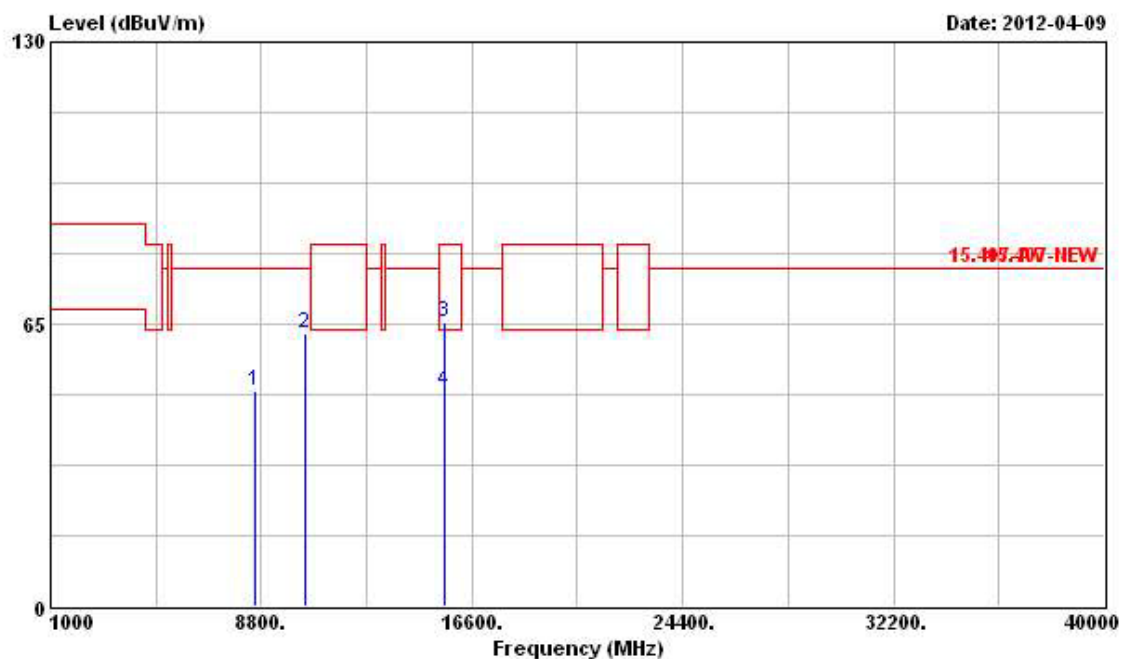
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6888.000	57.36	-20.48	77.84	50.93	35.85	5.57	34.99	Peak	---	---
2	10360.000	59.40	-18.44	77.84	49.69	38.22	6.71	35.22	Peak	---	---
3	15540.000	62.49	-21.05	83.54	48.26	40.81	8.45	35.03	Peak	---	---
4	15540.000	51.00	-12.54	63.54	36.77	40.81	8.45	35.03	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 40 (20 MHz)

Horizontal

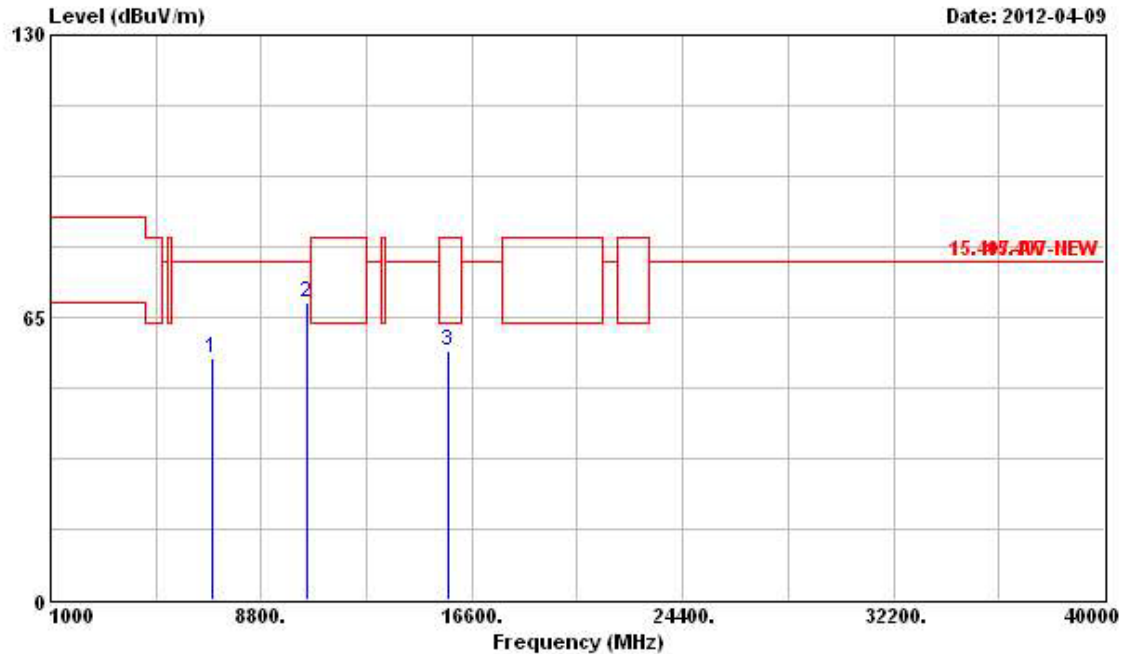
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6900.000	56.75	-21.09	77.84	50.31	35.86	5.57	34.99	Peak	---	---
2	10400.000	67.51	-10.33	77.84	57.70	38.24	6.75	35.18	Peak	---	---
3	15600.000	58.81	-4.73	63.54	44.62	40.84	8.45	35.10	PK	---	---

Vertical



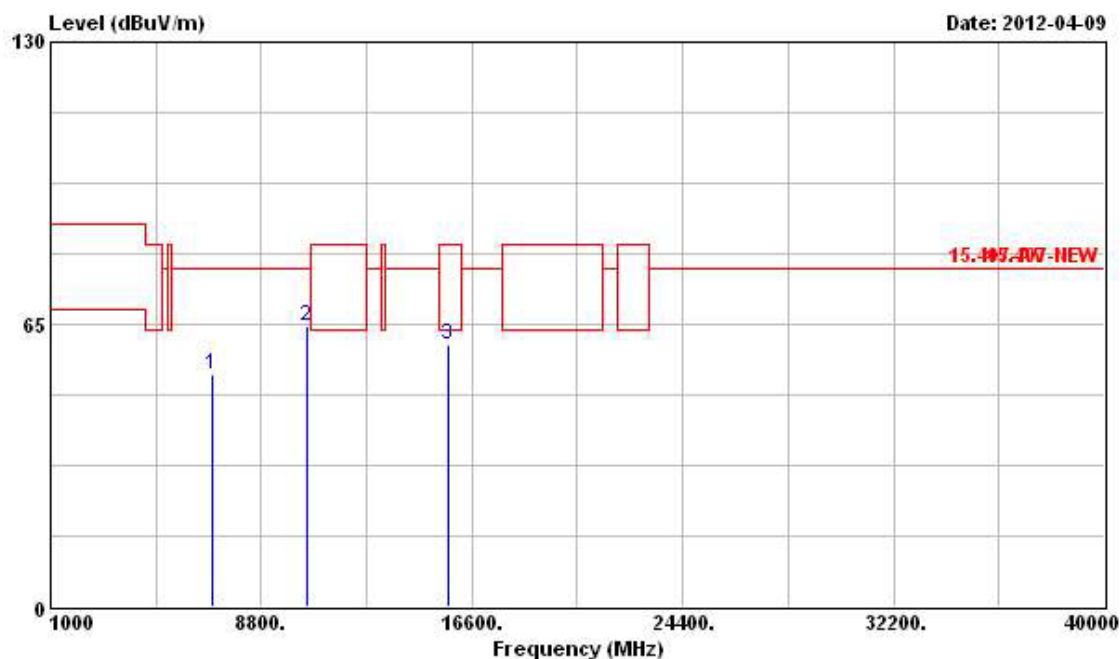
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8532.000	49.54	-28.30	77.84	42.50	36.32	5.96	35.24	Peak	---	---
2	10400.000	62.65	-15.19	77.84	52.84	38.24	6.75	35.18	Peak	---	---
3	15600.000	65.23	-18.31	83.54	51.04	40.84	8.45	35.10	Peak	---	---
4	15600.000	49.71	-13.83	63.54	35.52	40.84	8.45	35.10	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 48 (20 MHz)

Horizontal

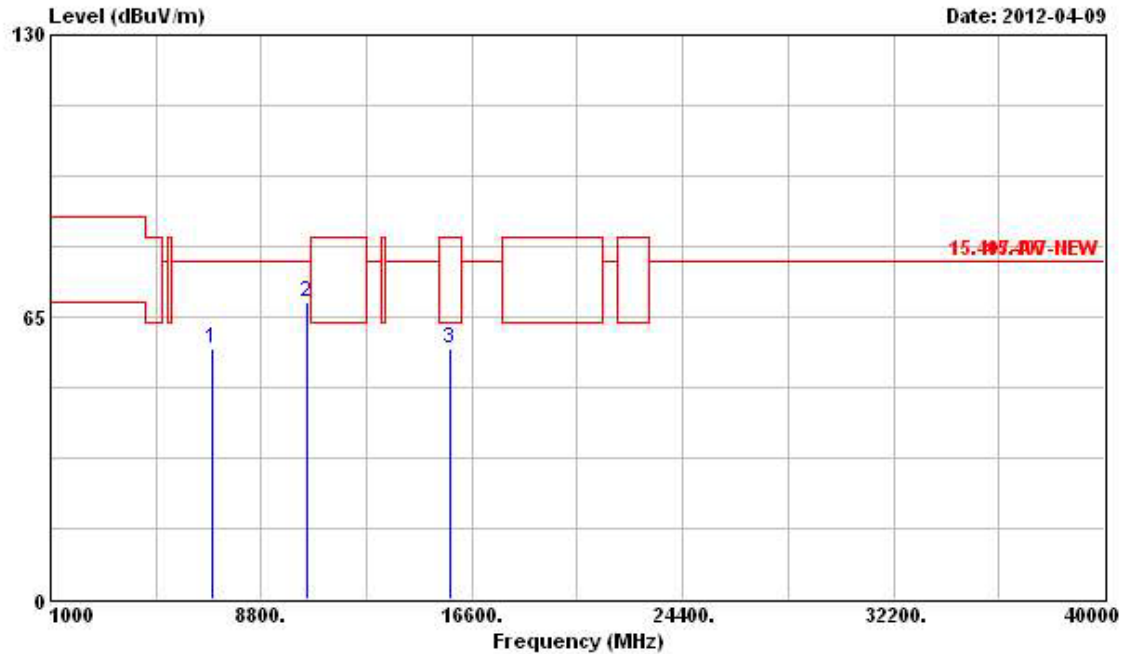
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6984.000	55.62	-22.22	77.84	49.16	35.89	5.59	35.02	Peak	---	---
2	10480.000	68.45	-9.39	77.84	58.46	38.29	6.82	35.12	Peak	---	---
3	15720.000	57.21	-6.33	63.54	43.06	40.89	8.46	35.20	PK	---	---

Vertical



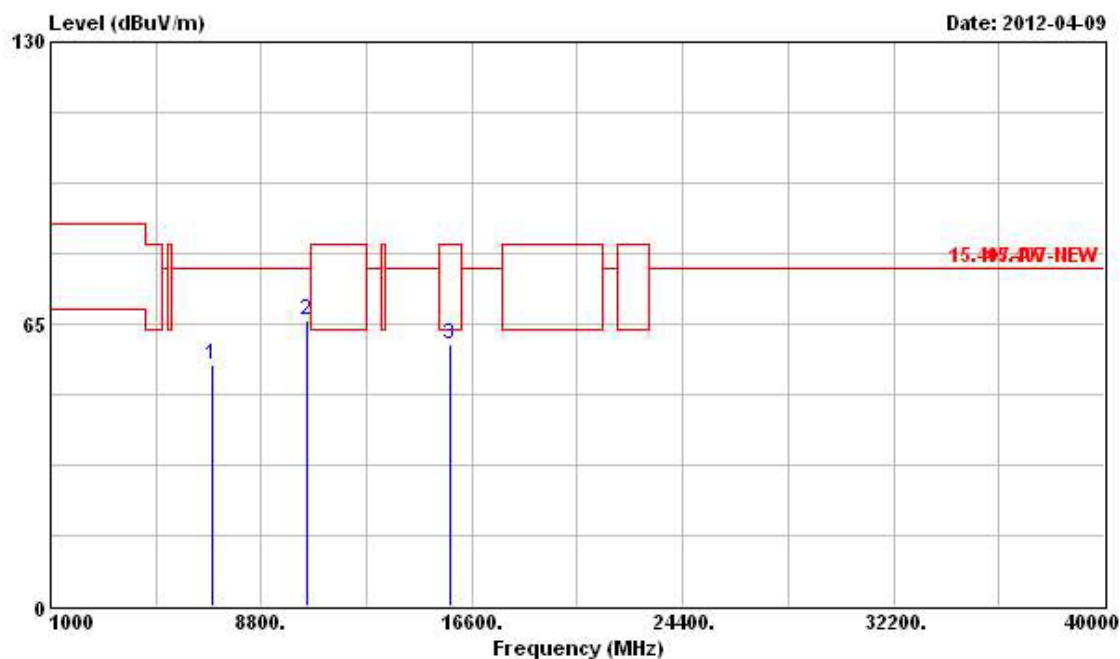
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6984.000	53.35	-24.49	77.84	46.89	35.89	5.59	35.02	Peak	---	---
2	10480.000	64.42	-13.42	77.84	54.43	38.29	6.82	35.12	Peak	---	---
3	15720.000	60.12	-3.42	63.54	45.97	40.89	8.46	35.20	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 52 (20MHz)

Horizontal

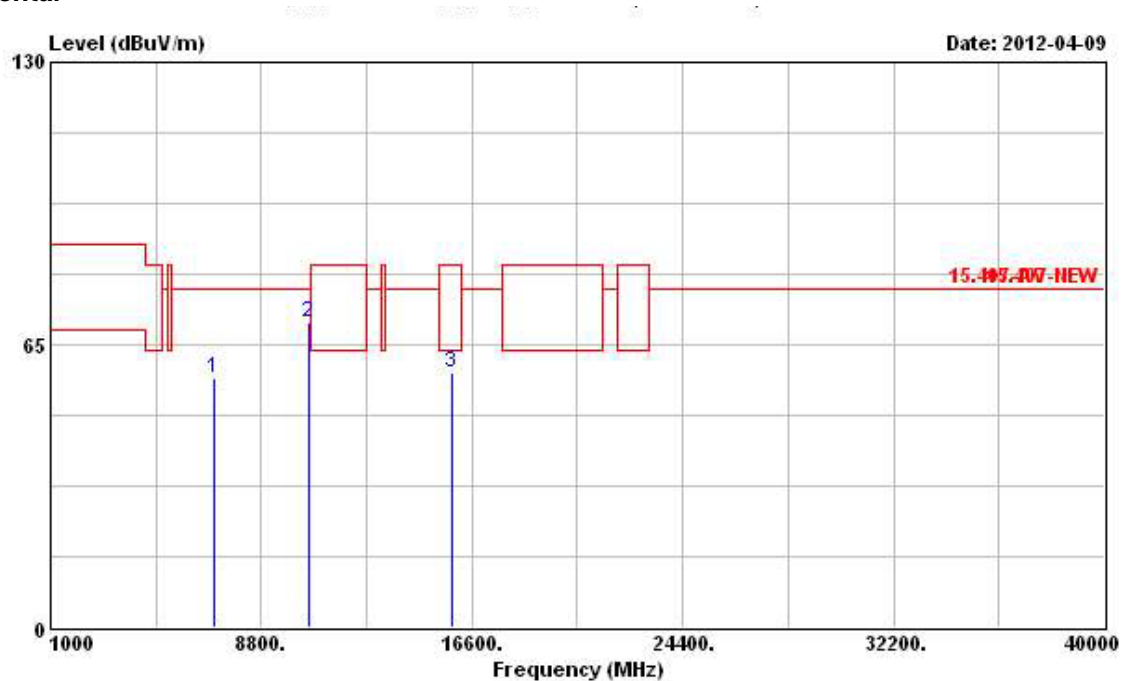
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	57.57	-20.27	77.84	51.09	35.90	5.60	35.02	Peak	---	---
2	10520.000	68.42	-9.42	77.84	58.36	38.31	6.85	35.10	Peak	---	---
3	15780.000	57.57	-5.97	63.54	43.48	40.91	8.46	35.28	PK	---	---

Vertical



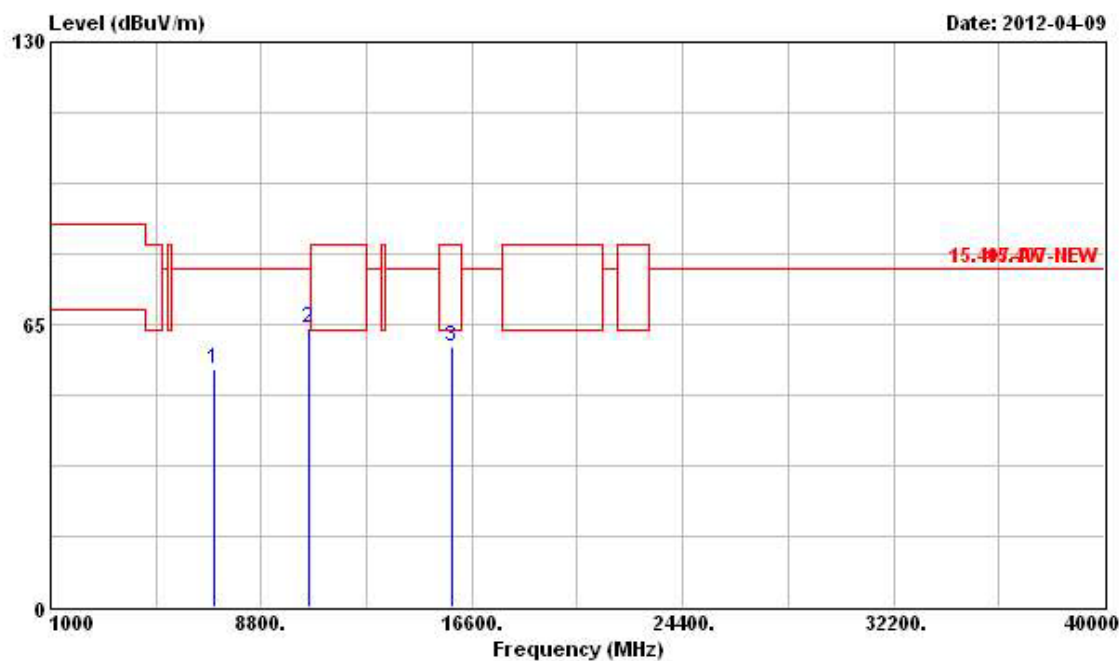
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	55.63	-22.21	77.84	49.15	35.90	5.60	35.02	Peak	---	---
2	10520.000	65.75	-12.09	77.84	55.69	38.31	6.85	35.10	Peak	---	---
3	15780.000	60.39	-3.15	63.54	46.30	40.91	8.46	35.28	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 56 (20 MHz)

Horizontal

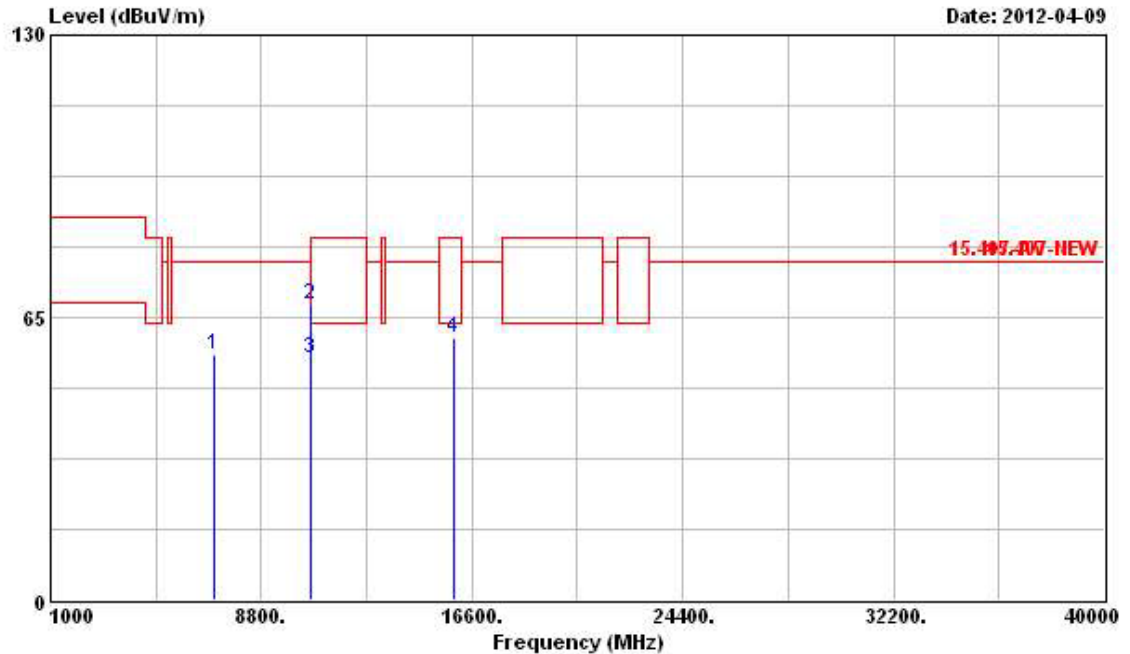
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7032.000	57.38	-20.46	77.84	50.92	35.89	5.60	35.03	Peak	---	---
2	10560.000	70.15	-7.69	77.84	60.00	38.33	6.88	35.06	Peak	---	---
3	15840.000	58.76	-4.78	63.54	44.69	40.94	8.46	35.33	PK	---	---

Vertical



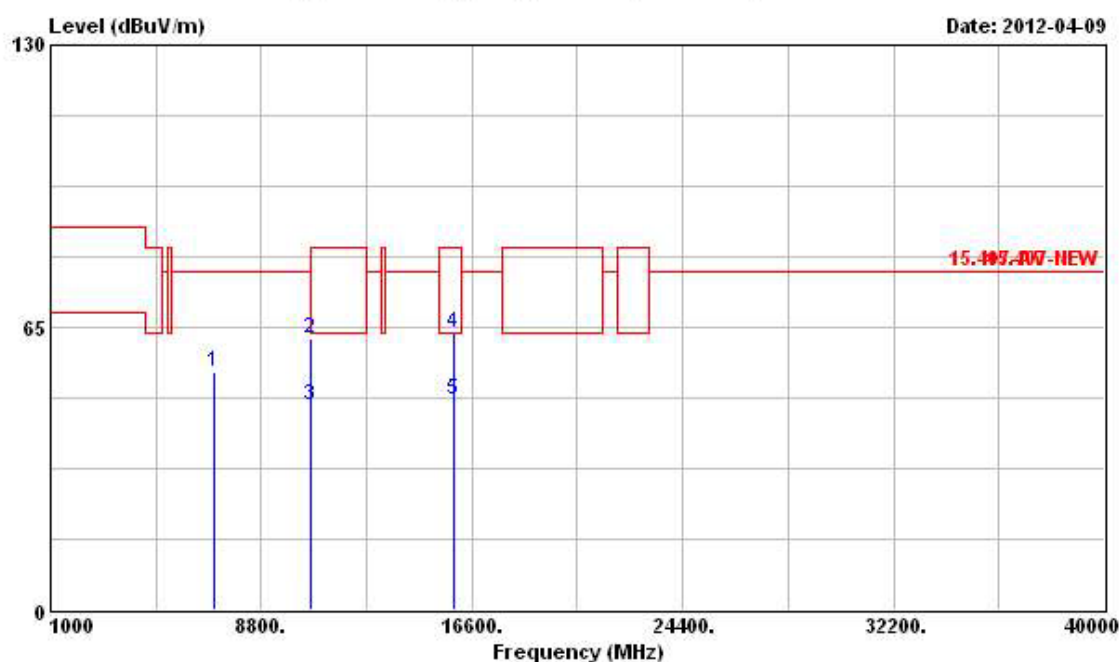
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7032.000	54.79	-23.05	77.84	48.33	35.89	5.60	35.03	Peak	---	---
2	10560.000	64.33	-13.51	77.84	54.18	38.33	6.88	35.06	Peak	---	---
3	15840.000	59.79	-3.75	63.54	45.72	40.94	8.46	35.33	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 64 (20 MHz)

Horizontal

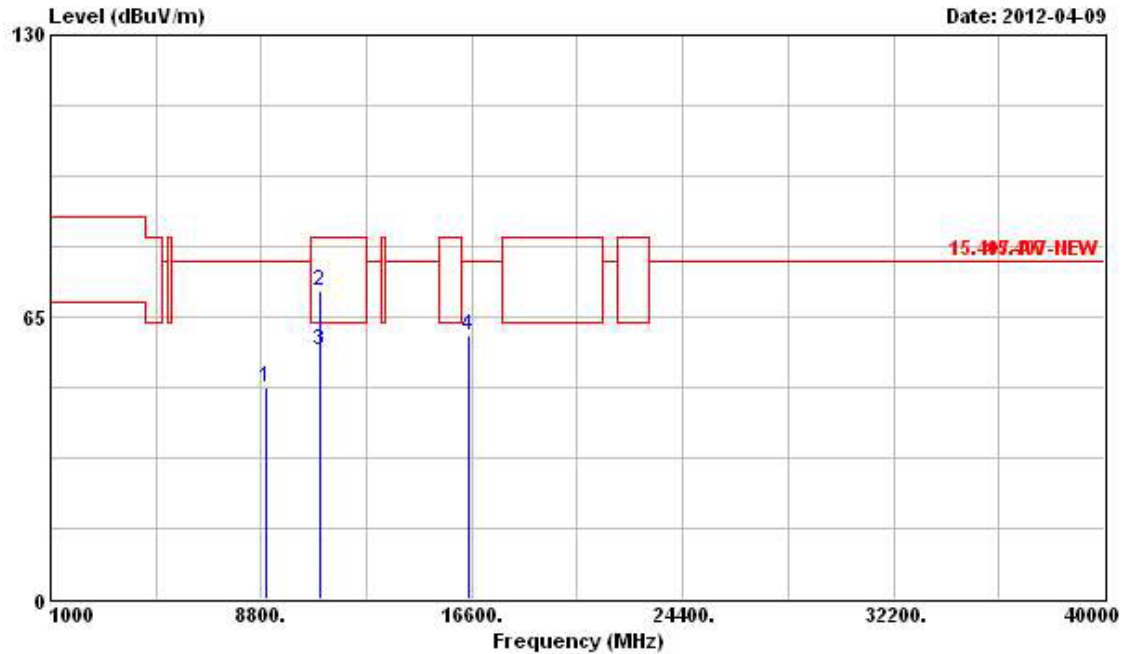
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	56.66	-21.18	77.84	50.21	35.88	5.61	35.04	Peak	---	---
2	10640.000	67.95	-15.59	83.54	57.64	38.38	6.93	35.00	Peak	---	---
3	10640.000	55.58	-7.96	63.54	45.27	38.38	6.93	35.00	Average	---	---
4	15960.000	60.17	-3.37	63.54	46.16	40.99	8.47	35.45	PK	---	---

Vertical



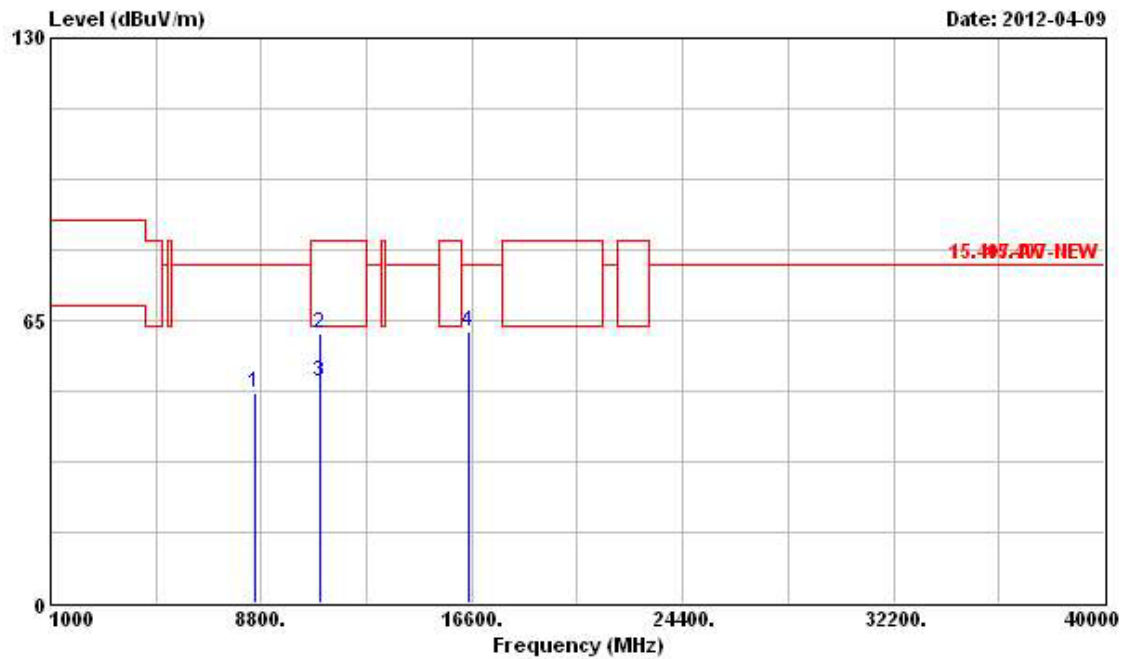
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	54.53	-23.31	77.84	48.08	35.88	5.61	35.04	Peak	---	---
2	10640.000	62.44	-21.10	83.54	52.13	38.38	6.93	35.00	Peak	---	---
3	10640.000	47.20	-16.34	63.54	36.89	38.38	6.93	35.00	Average	---	---
4	15960.000	63.78	-19.76	83.54	49.77	40.99	8.47	35.45	Peak	---	---
5	15960.000	48.14	-15.40	63.54	34.13	40.99	8.47	35.45	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 100 (20MHz)

Horizontal

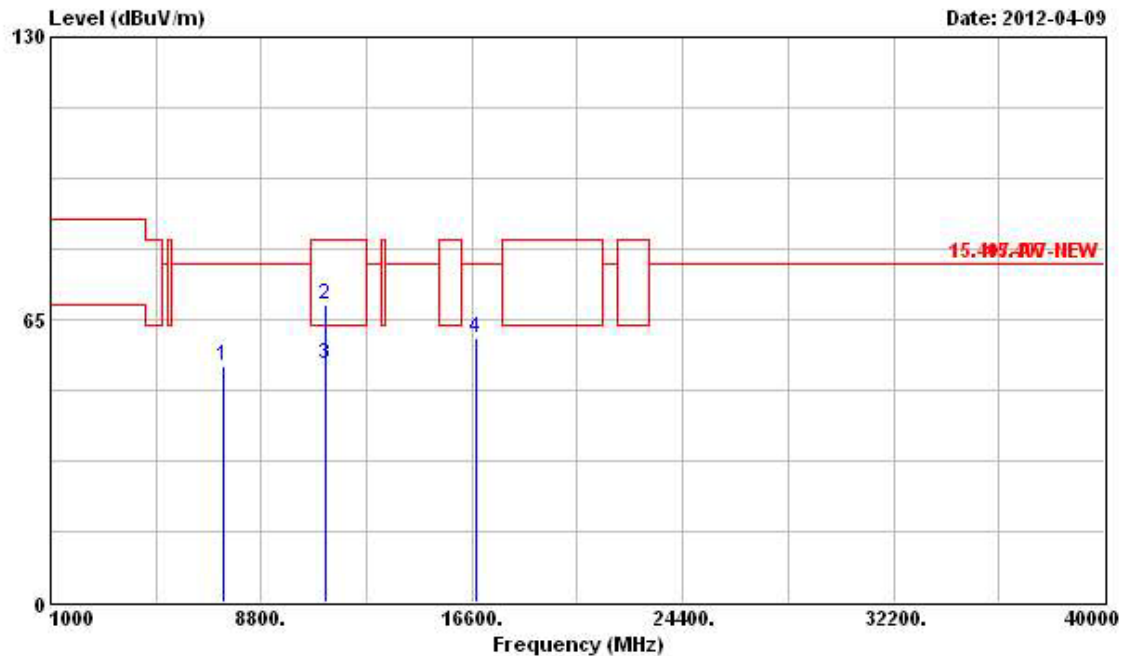
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8964.000	48.86	-28.98	77.84	41.46	36.57	6.14	35.31	Peak	---	---
2	11000.000	70.81	-12.73	83.54	59.76	38.60	7.17	34.72	Peak	---	---
3	11000.000	57.16	-6.38	63.54	46.11	38.60	7.17	34.72	Average	---	---
4	16500.000	60.76	-17.08	77.84	45.51	42.00	8.24	34.99	Peak	---	---

Vertical



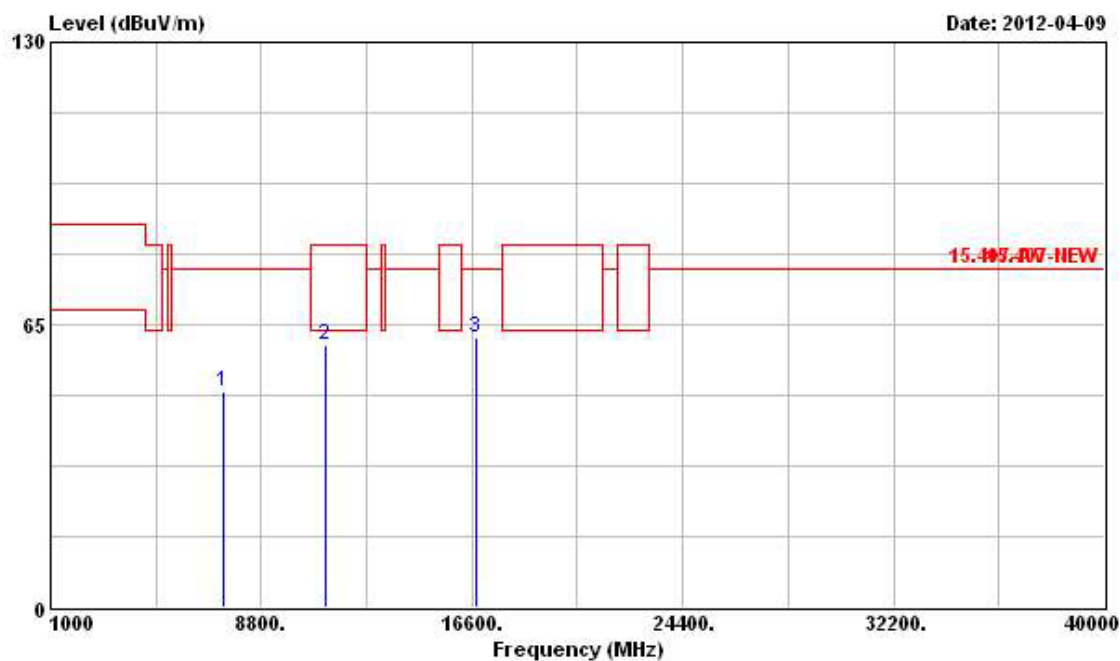
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8580.000	48.52	-29.32	77.84	41.45	36.35	5.97	35.25	Peak	---	---
2	11000.000	62.16	-21.38	83.54	51.11	38.60	7.17	34.72	Peak	---	---
3	11000.000	50.79	-12.75	63.54	39.74	38.60	7.17	34.72	Average	---	---
4	16500.000	62.46	-15.38	77.84	47.21	42.00	8.24	34.99	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 116 (20 MHz)

Horizontal

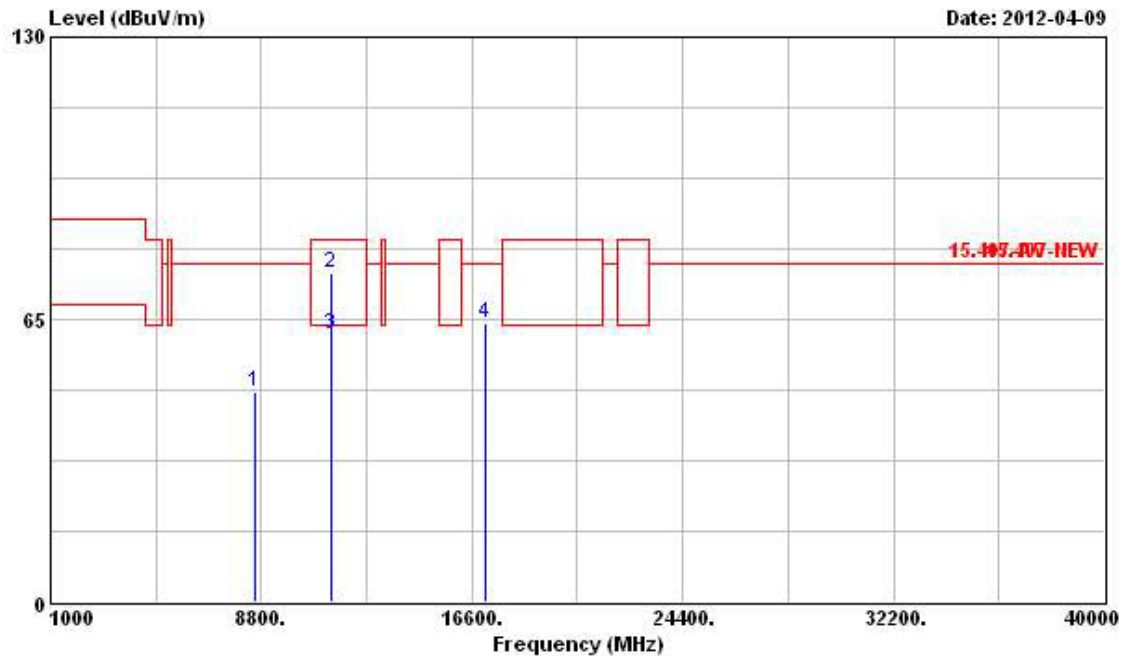
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7428.000	54.40	-23.44	77.84	48.07	35.81	5.65	35.13	PK	---	---
2	11160.000	68.25	-15.29	83.54	57.31	38.70	6.96	34.72	Peak	---	---
3	11160.000	54.69	-8.85	63.54	43.75	38.70	6.96	34.72	Average	---	---
4	16740.000	60.76	-17.08	77.84	44.94	41.86	8.47	34.51	Peak	---	---

Vertical



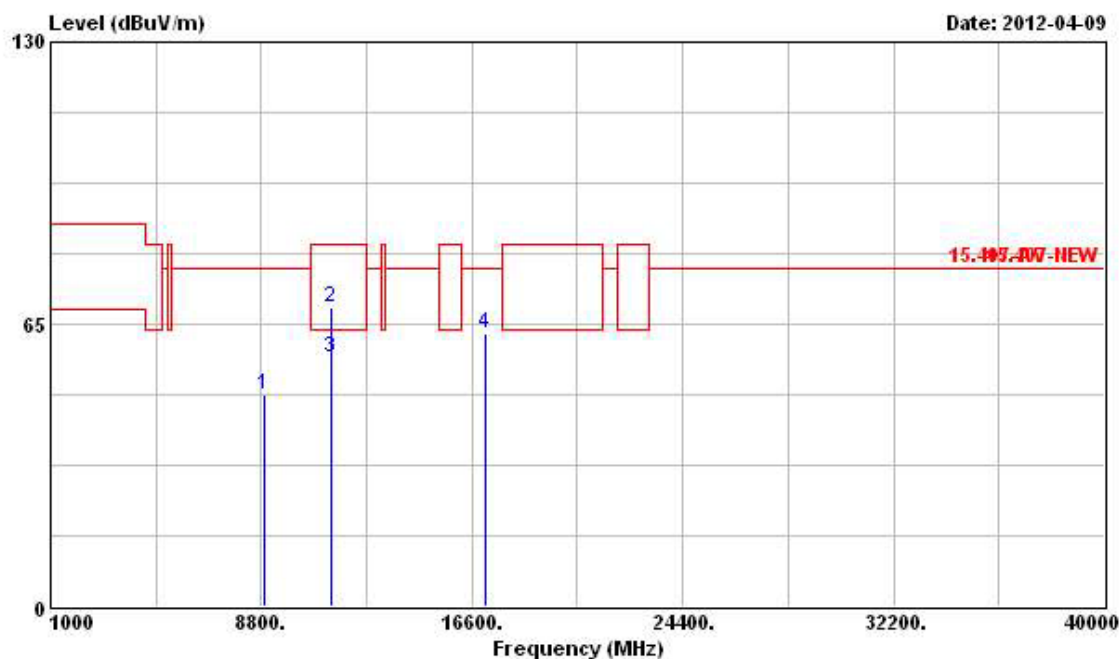
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7428.000	49.64	-28.20	77.84	43.31	35.81	5.65	35.13	PK	---	---
2	11160.000	60.29	-3.25	63.54	49.35	38.70	6.96	34.72	PK	---	---
3	16740.000	62.02	-15.82	77.84	46.20	41.86	8.47	34.51	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 140 (20 MHz)

Horizontal

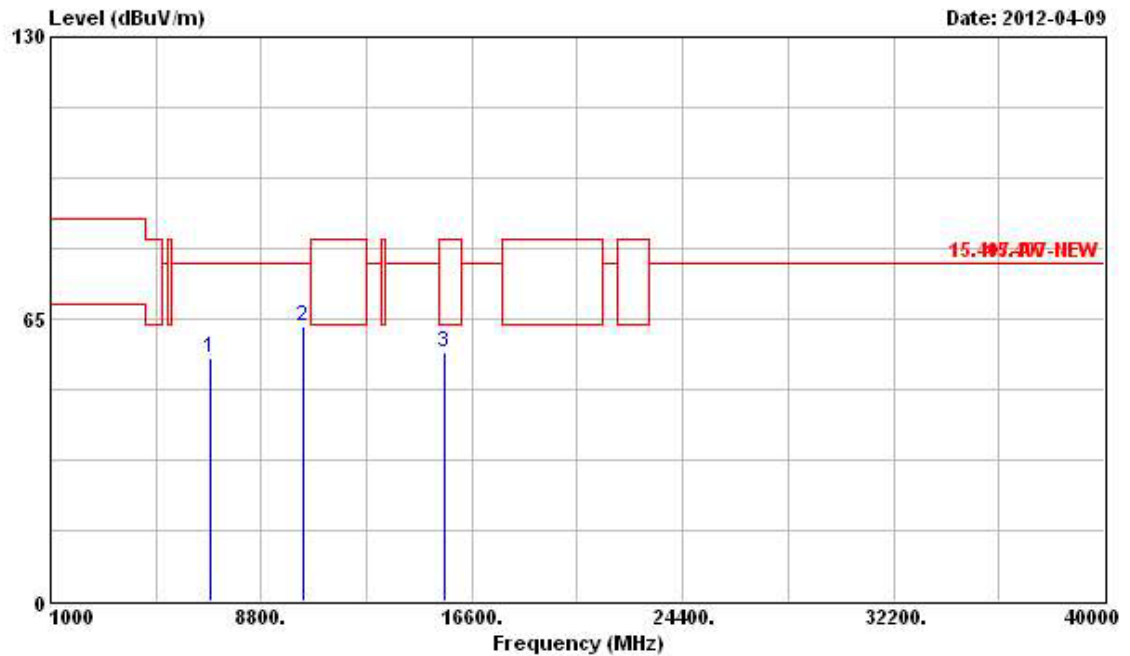
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8568.000	48.50	-29.34	77.84	41.44	36.34	5.97	35.25	Peak	---	---
2	11400.000	75.85	-7.69	83.54	65.02	38.84	6.71	34.72	Peak	---	---
3	11400.000	61.45	-2.09	63.54	50.62	38.84	6.71	34.72	Average	---	---
4	17100.000	63.98	-13.86	77.84	47.69	41.66	8.61	33.98	Peak	---	---

Vertical



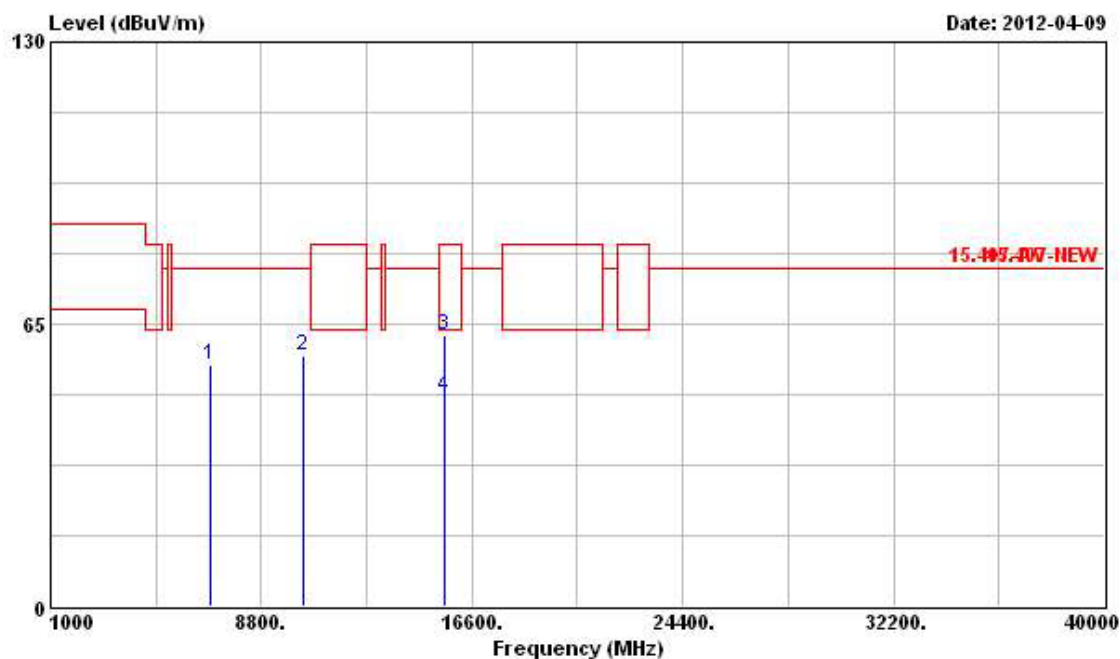
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8916.000	48.58	-29.26	77.84	41.20	36.55	6.13	35.30	Peak	---	---
2	11400.000	68.95	-14.59	83.54	58.12	38.84	6.71	34.72	Peak	---	---
3	11400.000	57.13	-6.41	63.54	46.30	38.84	6.71	34.72	Average	---	---
4	17100.000	62.71	-15.13	77.84	46.42	41.66	8.61	33.98	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 38 (40MHz)

Horizontal

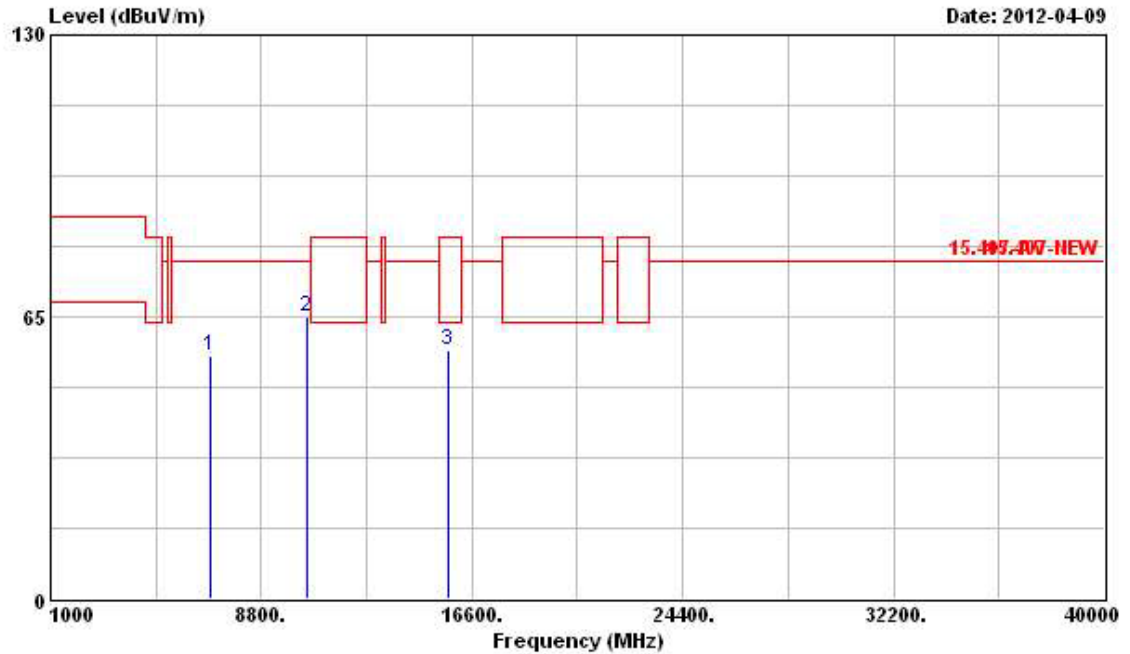
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6900.000	56.12	-21.72	77.84	49.68	35.86	5.57	34.99	Peak	---	---
2	10380.000	63.41	-14.43	77.84	53.63	38.23	6.75	35.20	Peak	---	---
3	15570.000	57.44	-6.10	63.54	43.21	40.83	8.45	35.05	PK	---	---

Vertical



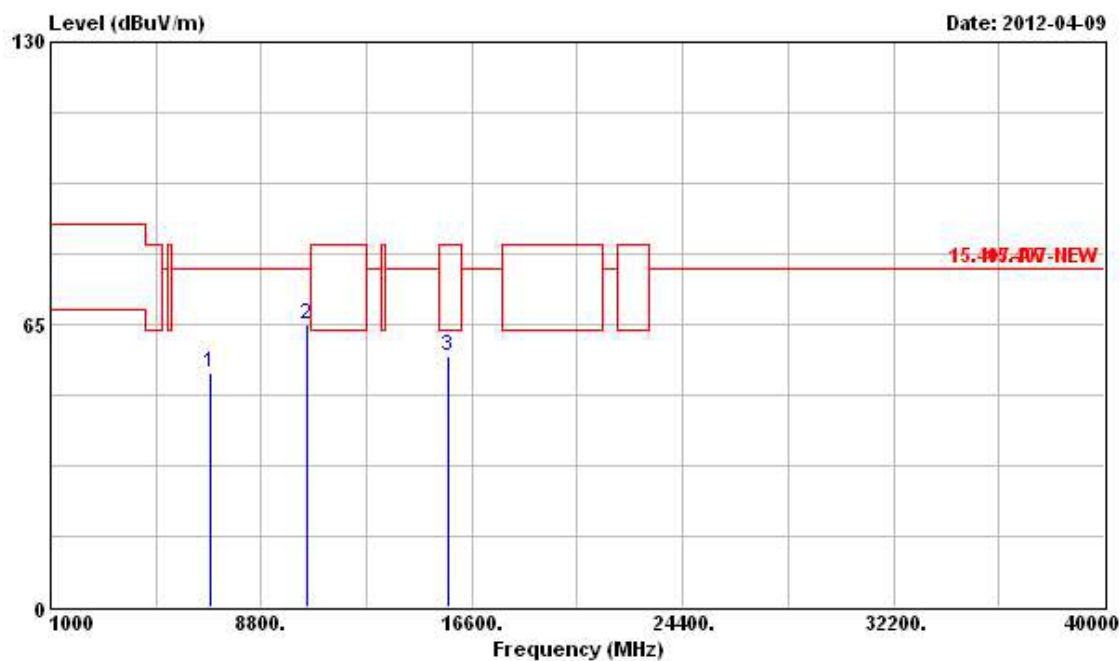
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6900.000	55.40	-22.44	77.84	48.96	35.86	5.57	34.99	Peak	---	---
2	10380.000	57.61	-20.23	77.84	47.83	38.23	6.75	35.20	Peak	---	---
3	15570.000	62.34	-21.20	83.54	48.11	40.83	8.45	35.05	Peak	---	---
4	15570.000	48.25	-15.29	63.54	34.02	40.83	8.45	35.05	Average	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 46 (40MHz)

Horizontal

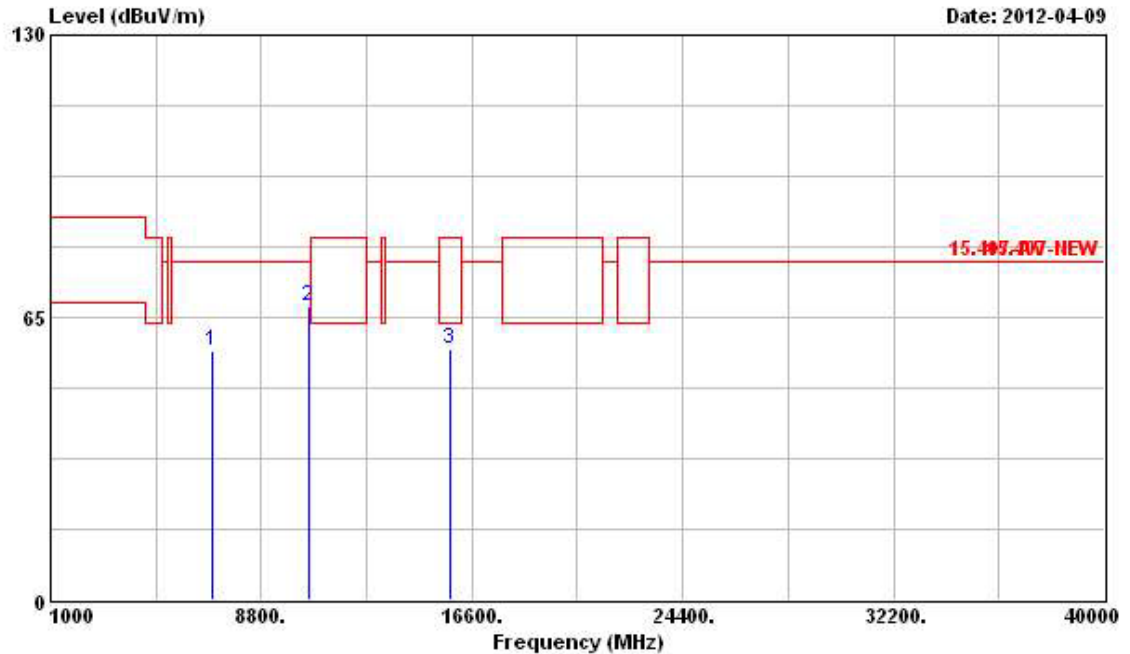
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6948.000	56.12	-21.72	77.84	49.66	35.88	5.59	35.01	Peak	---	---
2	10460.000	65.11	-12.73	77.84	55.16	38.27	6.82	35.14	Peak	---	---
3	15690.000	57.37	-6.17	63.54	43.21	40.88	8.46	35.18	PK	---	---

Vertical



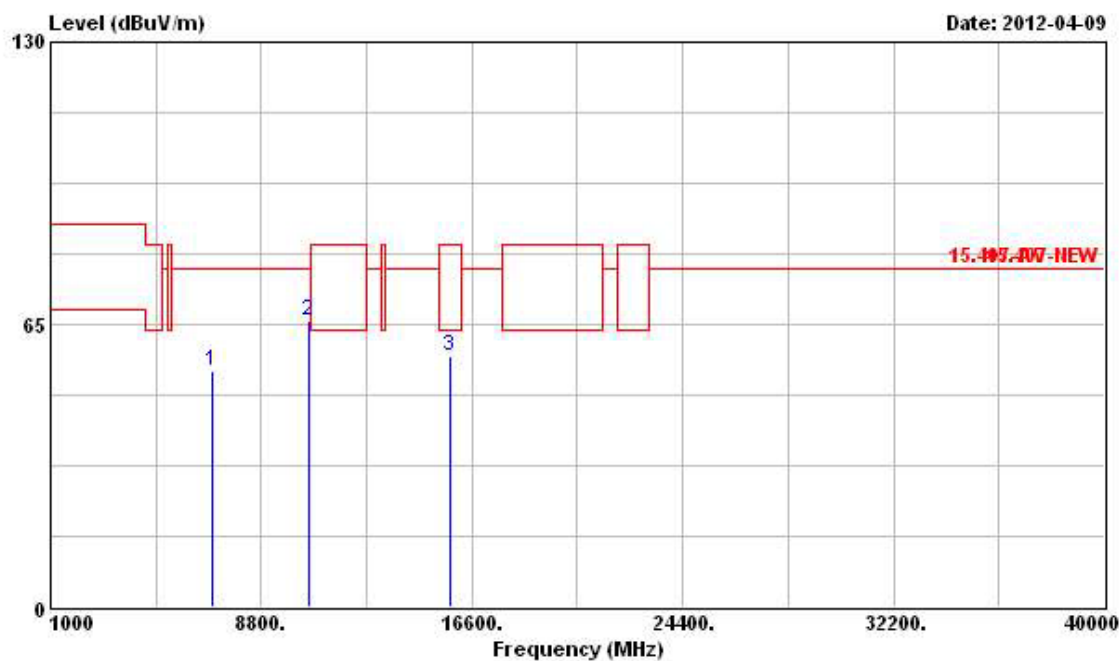
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6948.000	53.85	-23.99	77.84	47.39	35.88	5.59	35.01	Peak	---	---
2	10460.000	64.95	-12.89	77.84	55.00	38.27	6.82	35.14	Peak	---	---
3	15690.000	57.71	-5.83	63.54	43.55	40.88	8.46	35.18	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 54 (40MHz)

Horizontal

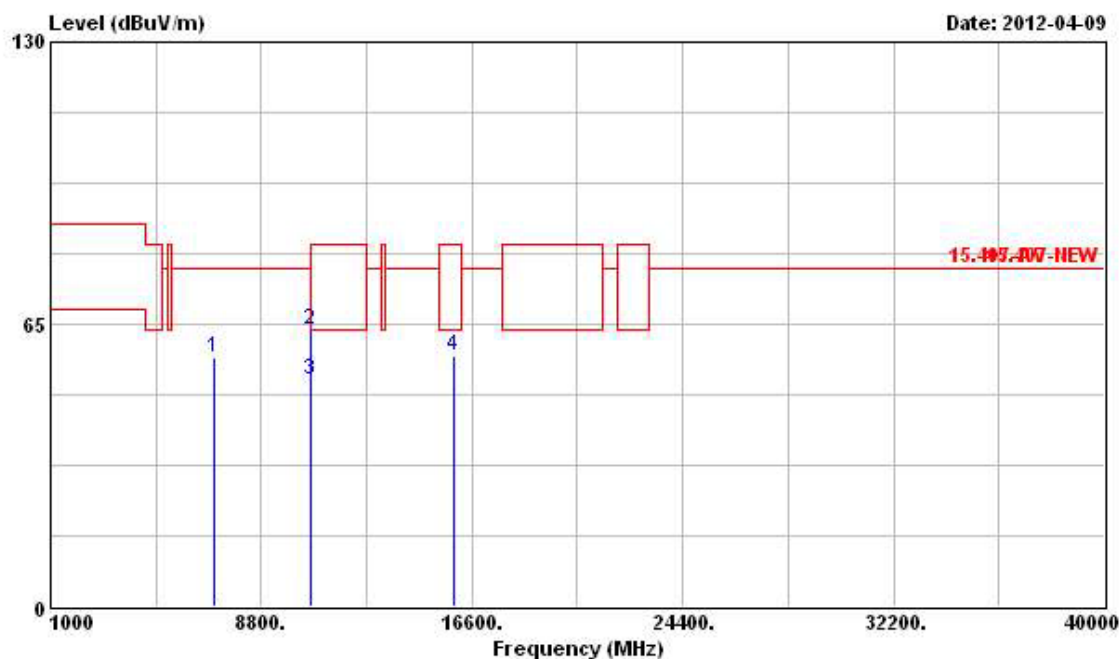
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	57.47	-20.37	77.84	50.99	35.90	5.60	35.02	Peak	---	---
2	10540.000	67.65	-10.19	77.84	57.53	38.32	6.88	35.08	Peak	---	---
3	15810.000	57.72	-5.82	63.54	43.64	40.92	8.46	35.30	PK	---	---

Vertical



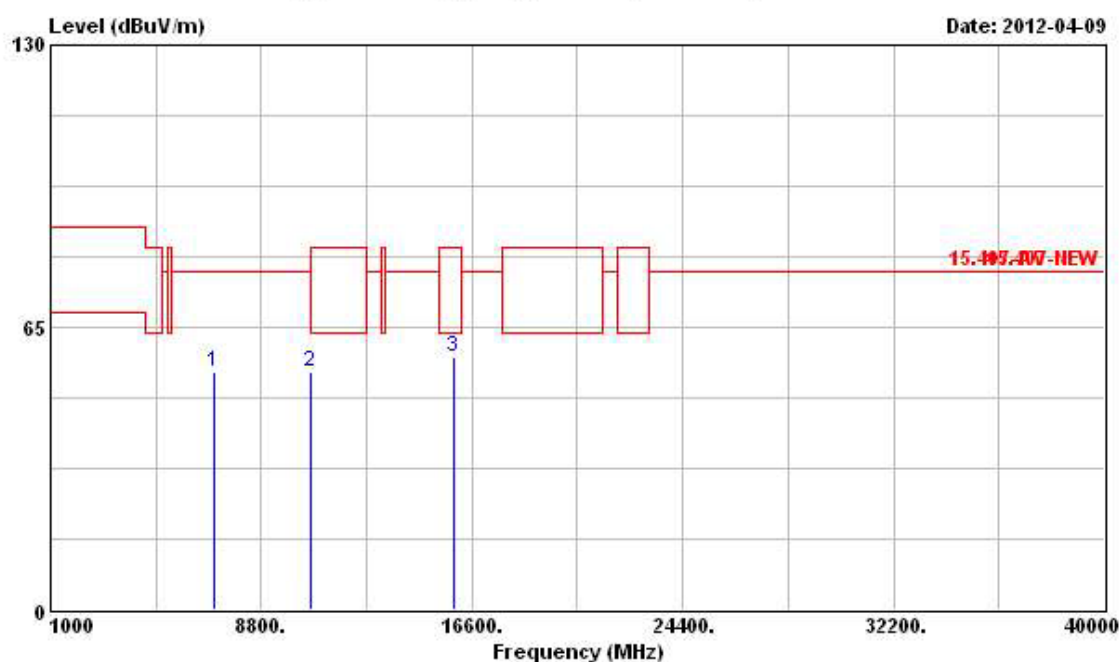
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	6996.000	54.28	-23.56	77.84	47.80	35.90	5.60	35.02	Peak	---	---
2	10540.000	65.83	-12.01	77.84	55.71	38.32	6.88	35.08	Peak	---	---
3	15810.000	57.61	-5.93	63.54	43.53	40.92	8.46	35.30	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 62 (40MHz)

Horizontal

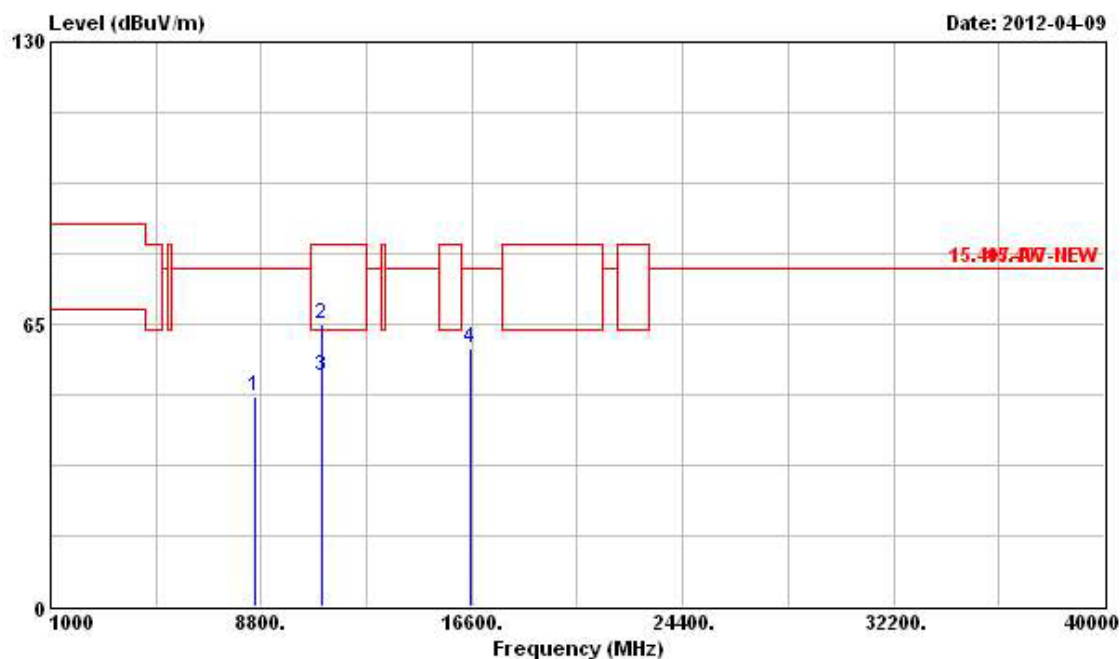
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	57.50	-20.34	77.84	51.05	35.88	5.61	35.04	Peak	---	---
2	10620.000	63.64	-19.90	83.54	53.36	38.37	6.93	35.02	Peak	---	---
3	10620.000	52.16	-11.38	63.54	41.88	38.37	6.93	35.02	Average	---	---
4	15930.000	57.81	-5.73	63.54	43.77	40.97	8.47	35.40	PK	---	---

Vertical



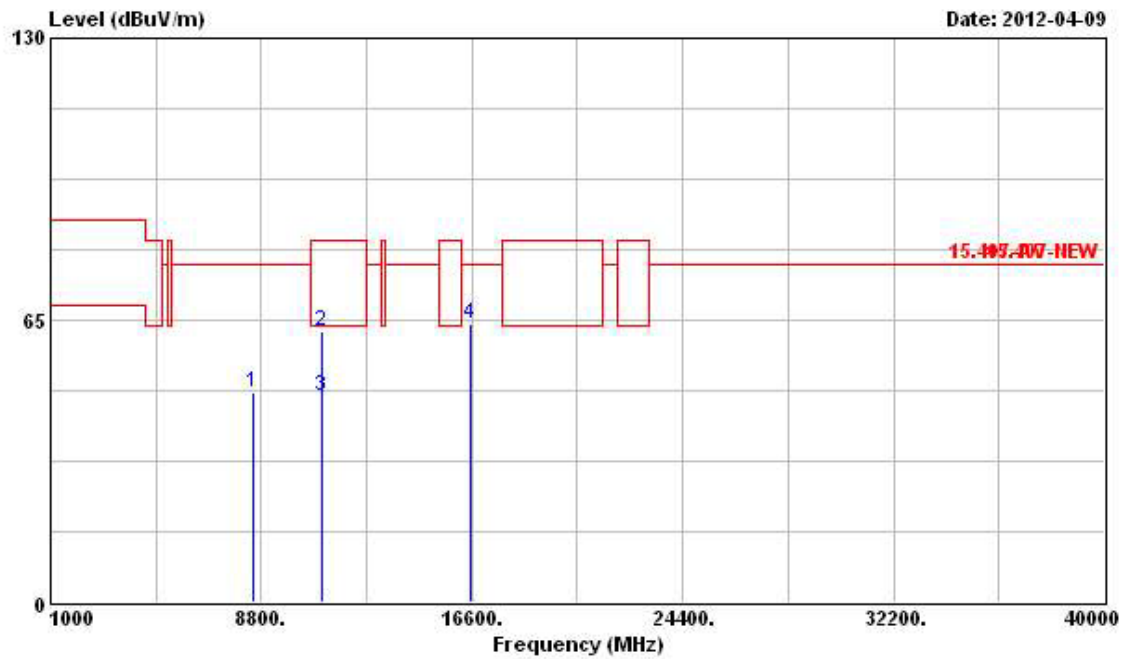
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7080.000	54.85	-22.99	77.84	48.40	35.88	5.61	35.04	Peak	---	---
2	10620.000	54.90	-8.64	63.54	44.62	38.37	6.93	35.02	PK	---	---
3	15930.000	57.97	-5.57	63.54	43.93	40.97	8.47	35.40	PK	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 102 (40MHz)

Horizontal

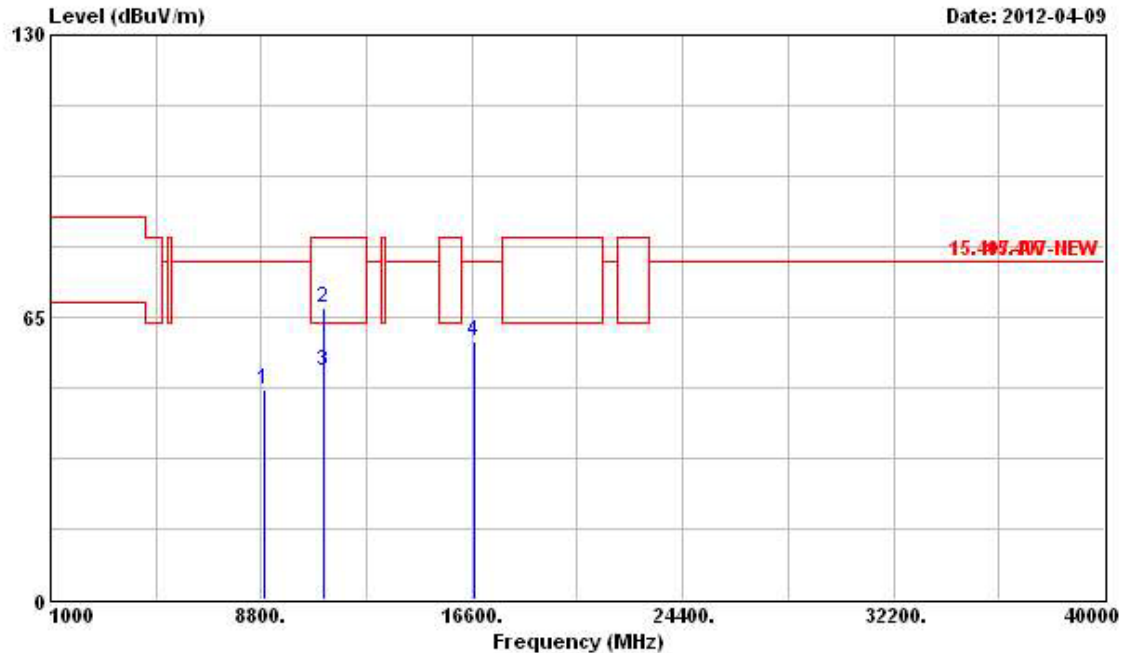
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8568.000	48.29	-29.55	77.84	41.23	36.34	5.97	35.25	Peak	---	---
2	11020.000	65.05	-18.49	83.54	54.03	38.61	7.13	34.72	Peak	---	---
3	11020.000	53.02	-10.52	63.54	42.00	38.61	7.13	34.72	Average	---	---
4	16530.000	59.33	-18.51	77.84	44.02	41.98	8.27	34.94	Peak	---	---

Vertical



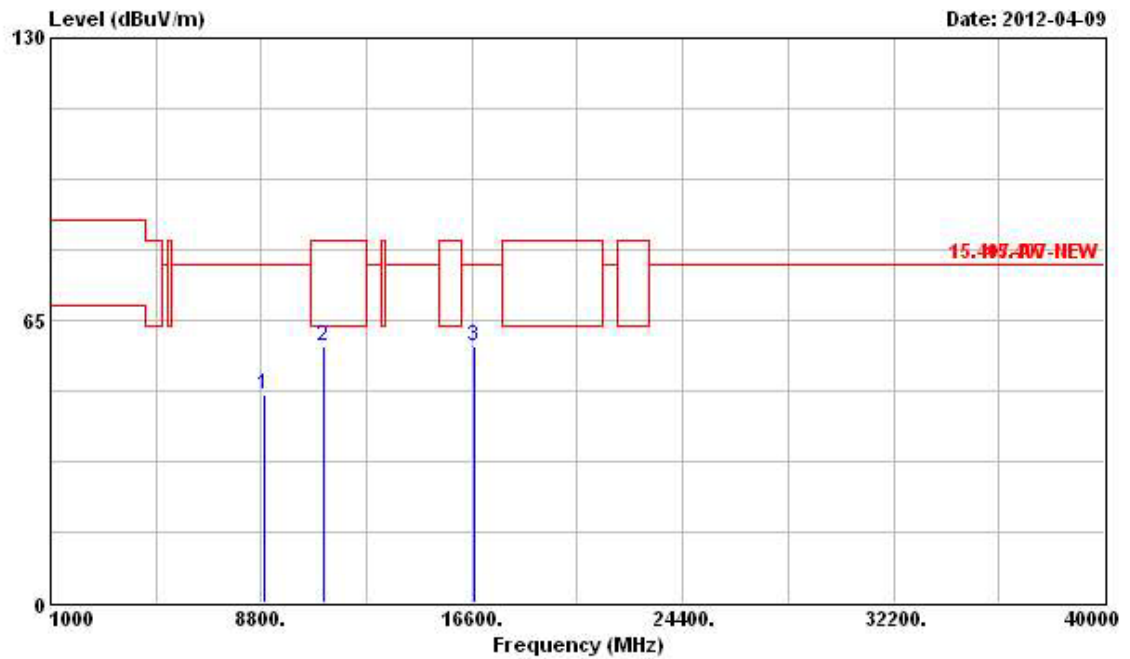
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8520.000	48.46	-29.38	77.84	41.43	36.31	5.96	35.24	Peak	---	---
2	11020.000	62.53	-21.01	83.54	51.51	38.61	7.13	34.72	Peak	---	---
3	11020.000	47.27	-16.27	63.54	36.25	38.61	7.13	34.72	Average	---	---
4	16530.000	64.20	-13.64	77.84	48.89	41.98	8.27	34.94	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 110 (40MHz)

Horizontal

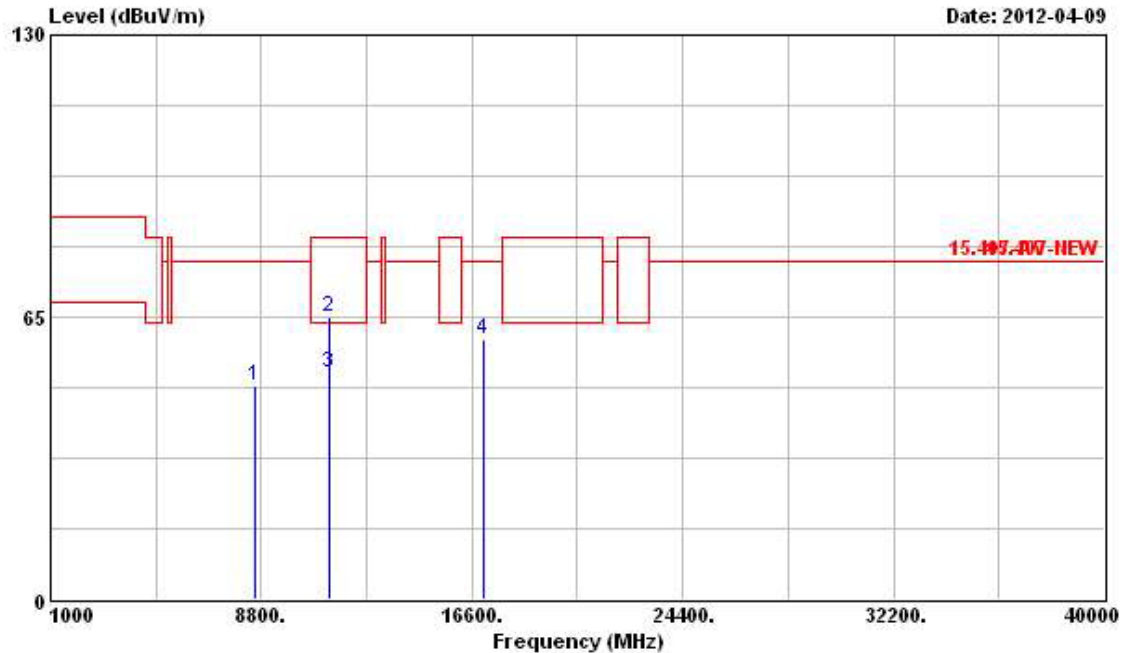
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8904.000	48.22	-29.62	77.84	40.85	36.54	6.13	35.30	Peak	---	---
2	11100.000	66.99	-16.55	83.54	56.00	38.66	7.05	34.72	Peak	---	---
3	11100.000	52.66	-10.88	63.54	41.67	38.66	7.05	34.72	Average	---	---
4	16650.000	59.27	-18.57	77.84	43.66	41.91	8.37	34.67	Peak	---	---

Vertical



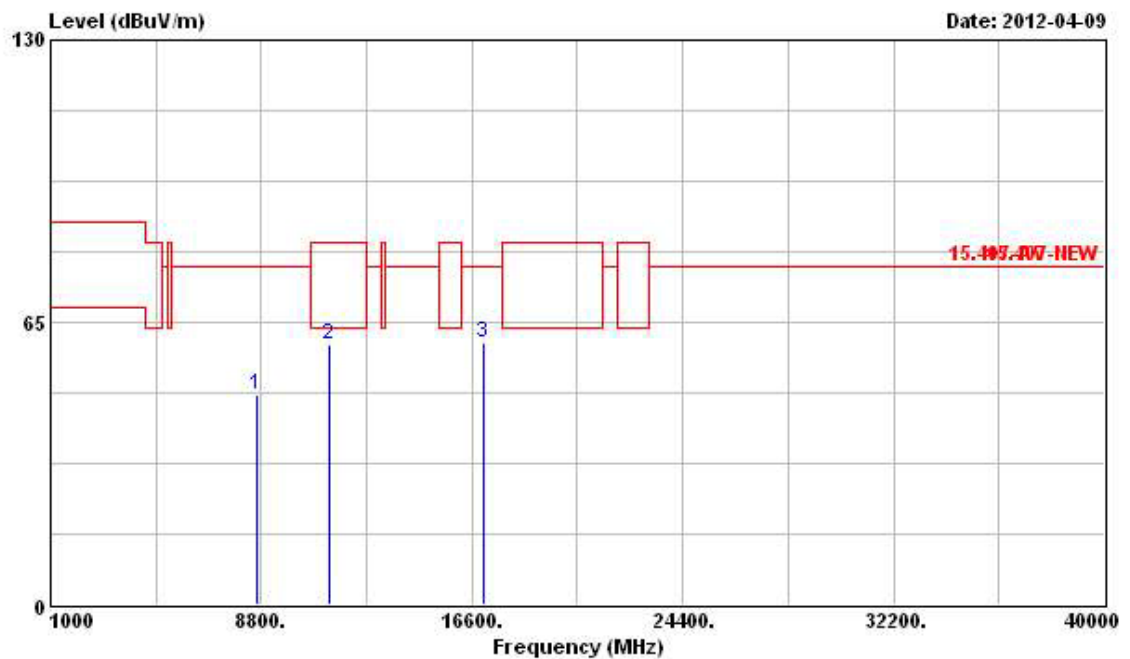
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8904.000	47.94	-29.90	77.84	40.57	36.54	6.13	35.30	Peak	---	---
2	11100.000	58.90	-4.64	63.54	47.91	38.66	7.05	34.72	PK	---	---
3	16650.000	59.21	-18.63	77.84	43.60	41.91	8.37	34.67	Peak	---	---

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n Ch. 134 (40MHz)

Horizontal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8568.000	49.28	-28.56	77.84	42.22	36.34	5.97	35.25	Peak	---	---
2	11340.000	64.82	-18.72	83.54	53.94	38.80	6.80	34.72	Peak	---	---
3	11340.000	52.02	-11.52	63.54	41.14	38.80	6.80	34.72	Average	---	---
4	17010.000	59.97	-17.87	77.84	43.61	41.69	8.65	33.98	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	8616.000	48.21	-29.63	77.84	41.11	36.37	5.99	35.26	Peak	---	---
2	11340.000	60.05	-3.49	63.54	49.17	38.80	6.80	34.72	PK	---	---
3	17010.000	60.16	-17.68	77.84	43.80	41.69	8.65	33.98	Peak	---	---

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (Uv/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.7 Band Edge and Fundamental Emissions Measurement

3.7.1 Limit

For transmitters operating in the 5.15~5.25 GHz band: all emissions outside of the 5.15~5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.47~5.725 GHz band: all emissions outside of the 5.47~5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.7.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1 MHz /1 MHz for Peak

3.7.3 Test Procedures

1. The test procedure is the same as section 3.6.3; only the frequency range investigated is limited to 100MHz around band edges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

3.7.4 Test Setup Layout

This test setup layout is the same as that shown in section 3.6.4.

3.7.5 Test Deviation

There is no deviation with the original standard.

3.7.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.7.7 Test Result of Band Edge and Fundamental Emissions

For Single Chain:

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 36, 40, 48

Channel 36

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5149.900	57.94	-5.60	63.54	18.27	34.89	4.78	0.00	Average	---	---
2 X	5181.900	103.09			63.38	34.91	4.80	0.00	Average	---	---
1	5149.900	73.00	-10.54	83.54	33.33	34.89	4.78	0.00	Peak	---	---
2 X	5183.400	112.89			73.18	34.91	4.80	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 40

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5147.400	56.06	-7.48	63.54	16.39	34.89	4.78	0.00	Average	---	---
2 X	5196.900	103.78			64.05	34.92	4.81	0.00	Average	---	---
3	5350.000	54.65	-8.89	63.54	14.77	35.01	4.87	0.00	Average	---	---
1	5147.400	68.47	-15.07	83.54	28.80	34.89	4.78	0.00	Peak	---	---
2 X	5202.900	113.14			73.41	34.92	4.81	0.00	Peak	---	---
3	5397.000	67.91	-15.63	83.54	27.99	35.04	4.88	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 48

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5117.400	54.94	-8.60	63.54	15.29	34.87	4.78	0.00	Average	---	---
2 X	5242.200	103.76			63.99	34.95	4.82	0.00	Average	---	---
3	5351.700	54.61	-8.93	63.54	14.73	35.01	4.87	0.00	Average	---	---
1	5140.500	68.06	-15.48	83.54	28.39	34.89	4.78	0.00	Peak	---	---
2 X	5243.400	113.47			73.70	34.95	4.82	0.00	Peak	---	---
3	5388.600	67.86	-15.68	83.54	27.95	35.03	4.88	0.00	Peak	---	---

The item 2 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 52, 56, 64

Channel 52

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5143.800	54.92	-8.62	63.54	15.25	34.89	4.78	0.00	Average	---	---
2 X	5256.900	104.61			64.84	34.95	4.82	0.00	Average	---	---
3	5360.100	54.68	-8.86	63.54	14.80	35.01	4.87	0.00	Average	---	---
1	5114.100	68.24	-15.30	83.54	28.60	34.87	4.77	0.00	Peak	---	---
2 X	5253.300	114.19			74.42	34.95	4.82	0.00	Peak	---	---
3	5374.200	68.99	-14.55	83.54	29.10	35.02	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 56

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5143.800	54.93	-8.61	63.54	15.26	34.89	4.78	0.00	Average	---	---
2 X	5283.000	104.15			64.34	34.97	4.84	0.00	Average	---	---
3	5353.800	54.76	-8.78	63.54	14.88	35.01	4.87	0.00	Average	---	---
1	5112.600	68.72	-14.82	83.54	29.08	34.87	4.77	0.00	Peak	---	---
2 X	5284.200	113.62			73.81	34.97	4.84	0.00	Peak	---	---
3	5352.900	68.07	-15.47	83.54	28.19	35.01	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 64

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5317.420	101.95			62.11	34.99	4.85	0.00	Average	---	---
2	5372.300	55.11	-8.43	63.54	15.22	35.02	4.87	0.00	Average	---	---
1 X	5316.020	111.74			71.90	34.99	4.85	0.00	Peak	---	---
2	5370.900	67.29	-16.25	83.54	27.40	35.02	4.87	0.00	Peak	---	---

The item 1 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11a Ch. 100, 116, 140

Channel 100

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5447.840	55.62	-7.92	63.54	15.65	35.07	4.90	0.00	Average	---	---
2 X	5498.320	102.88			62.87	35.10	4.91	0.00	Average	---	---
1	5446.480	69.12	-14.42	83.54	29.15	35.07	4.90	0.00	Peak	---	---
2 X	5497.440	112.13			72.12	35.10	4.91	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 116

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5450.160	55.48	-8.06	63.54	15.51	35.07	4.90	0.00	Average	---	---
2 X	5576.880	92.14			52.03	35.16	4.95	0.00	Average	---	---
3	5726.640	56.13	-21.71	77.84	15.81	35.28	5.04	0.00	Average	---	---
1	5457.840	68.41	-15.13	83.54	28.44	35.07	4.90	0.00	Peak	---	---
2 X	5575.600	101.20			61.09	35.16	4.95	0.00	Peak	---	---
3	5738.160	68.51	-9.33	77.84	28.18	35.29	5.04	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 140

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5697.320	100.57			60.30	35.25	5.02	0.00	Average	---	---
2	5725.000	55.81	-22.03	77.84	15.49	35.28	5.04	0.00	Average	---	---
1 X	5703.140	110.40			70.09	35.27	5.04	0.00	Peak	---	---
2	5725.940	70.13	-7.71	77.84	29.81	35.28	5.04	0.00	Peak	---	---

The item 1 is fundamental emissions.

For Two Chains:

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (20MHz) Ch. 36, 40, 48

Channel 36

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5128.300	55.41	-8.13	63.54	15.75	34.88	4.78	0.00	Average	---	---
2 X	5181.800	98.42			58.71	34.91	4.80	0.00	Average	---	---
1	5105.100	68.63	-14.91	83.54	29.00	34.86	4.77	0.00	Peak	---	---
2 X	5182.700	110.25			70.54	34.91	4.80	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 40

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5147.700	55.02	-8.52	63.54	15.35	34.89	4.78	0.00	Average	---	---
2 X	5197.800	97.96			58.23	34.92	4.81	0.00	Average	---	---
3	5358.600	54.49	-9.05	63.54	14.61	35.01	4.87	0.00	Average	---	---
1	5148.900	67.47	-16.07	83.54	27.80	34.89	4.78	0.00	Peak	---	---
2 X	5202.600	109.11			69.38	34.92	4.81	0.00	Peak	---	---
3	5351.400	68.10	-15.44	83.54	28.22	35.01	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 48

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5128.200	54.60	-8.94	63.54	14.94	34.88	4.78	0.00	Average	---	---
2 X	5241.300	97.99			58.23	34.94	4.82	0.00	Average	---	---
3	5351.400	54.41	-9.13	63.54	14.53	35.01	4.87	0.00	Average	---	---
1	5127.300	67.92	-15.62	83.54	28.26	34.88	4.78	0.00	Peak	---	---
2 X	5243.400	109.28			69.51	34.95	4.82	0.00	Peak	---	---
3	5352.900	67.43	-16.11	83.54	27.55	35.01	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (20MHz) Ch. 52, 56, 64

Channel 52

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5142.600	54.72	-8.82	63.54	15.05	34.89	4.78	0.00	Average	---	---
2 X	5257.800	100.25			60.48	34.95	4.82	0.00	Average	---	---
3	5351.400	54.62	-8.92	63.54	14.74	35.01	4.87	0.00	Average	---	---
1	5141.400	67.81	-15.73	83.54	28.14	34.89	4.78	0.00	Peak	---	---
2 X	5262.600	111.25			71.47	34.96	4.82	0.00	Peak	---	---
3	5355.000	67.91	-15.63	83.54	28.03	35.01	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 56

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5140.500	54.68	-8.86	63.54	15.01	34.89	4.78	0.00	Average	---	---
2 X	5281.800	98.96			59.15	34.97	4.84	0.00	Average	---	---
3	5362.200	54.42	-9.12	63.54	14.53	35.02	4.87	0.00	Average	---	---
1	5127.000	68.04	-15.50	83.54	28.38	34.88	4.78	0.00	Peak	---	---
2 X	5283.000	109.91			70.10	34.97	4.84	0.00	Peak	---	---
3	5362.500	67.84	-15.70	83.54	27.95	35.02	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 64

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5319.170	97.61			57.77	34.99	4.85	0.00	Average	---	---
2	5372.370	54.60	-8.94	63.54	14.71	35.02	4.87	0.00	Average	---	---
1 X	5317.420	108.74			68.90	34.99	4.85	0.00	Peak	---	---
2	5365.930	68.09	-15.45	83.54	28.20	35.02	4.87	0.00	Peak	---	---

The item 1 is fundamental emissions.

Final Test Date	Apr. 11, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (20MHz) Ch. 100, 116, 140

Channel 100

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5448.160	55.60	-7.94	63.54	15.63	35.07	4.90	0.00	Average	---	---
2 X	5501.280	100.22			60.21	35.10	4.91	0.00	Average	---	---
1	5448.400	68.38	-15.16	83.54	28.41	35.07	4.90	0.00	Peak	---	---
2 X	5502.880	112.12			72.11	35.10	4.91	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 116

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5446.000	56.12	-7.42	63.54	16.15	35.07	4.90	0.00	Average	---	---
2 X	5579.120	102.97			62.86	35.16	4.95	0.00	Average	---	---
3	5725.360	56.37	-21.47	77.84	16.05	35.28	5.04	0.00	Average	---	---
1	5457.520	69.19	-14.35	83.54	29.22	35.07	4.90	0.00	Peak	---	---
2 X	5578.160	112.82			72.71	35.16	4.95	0.00	Peak	---	---
3	5738.160	69.62	-8.22	77.84	29.29	35.29	5.04	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 140

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5701.160	100.10			59.79	35.27	5.04	0.00	Average	---	---
2	5725.000	56.01	-21.83	77.84	15.69	35.28	5.04	0.00	Average	---	---
1 X	5702.840	112.34			72.03	35.27	5.04	0.00	Peak	---	---
2	5728.100	70.12	-7.72	77.84	29.80	35.28	5.04	0.00	Peak	---	---

The item 1 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (40MHz) Ch. 38, 46

Channel 38

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark	Ant Pos	Table Pos		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	5150.000	59.25	-4.29	63.54	19.58	34.89	4.78	0.00	Average	---	---
2 X	5196.030	94.32			54.59	34.92	4.81	0.00	Average	---	---
1	5147.730	74.25	-9.29	83.54	34.58	34.89	4.78	0.00	Peak	---	---
2 X	5195.450	106.30			66.57	34.92	4.81	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 46

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark	Ant Pos	Table Pos		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg		
1	5138.750	54.74	-8.80	63.54	15.08	34.88	4.78	0.00	Average	---	---
2 X	5241.750	94.46			54.69	34.95	4.82	0.00	Average	---	---
3	5357.750	54.53	-9.01	63.54	14.65	35.01	4.87	0.00	Average	---	---
1	5120.750	68.40	-15.14	83.54	28.75	34.87	4.78	0.00	Peak	---	---
2 X	5235.500	106.19			66.43	34.94	4.82	0.00	Peak	---	---
3	5369.500	67.70	-15.84	83.54	27.81	35.02	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9°C	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (40MHz) Ch. 54, 62

Channel 54

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5145.000	54.71	-8.83	63.54	15.04	34.89	4.78	0.00	Average	---	---
2 X	5254.200	95.33			55.56	34.95	4.82	0.00	Average	---	---
3	5351.700	54.59	-8.95	63.54	14.71	35.01	4.87	0.00	Average	---	---
1	5116.500	67.81	-15.73	83.54	28.16	34.87	4.78	0.00	Peak	---	---
2 X	5256.600	106.73			66.96	34.95	4.82	0.00	Peak	---	---
3	5365.800	67.75	-15.79	83.54	27.86	35.02	4.87	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 62

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5294.300	95.38			55.56	34.98	4.84	0.00	Average	---	---
2	5350.000	56.89	-6.65	63.54	17.01	35.01	4.87	0.00	Average	---	---
1 X	5315.400	106.88			67.04	34.99	4.85	0.00	Peak	---	---
2	5355.100	71.06	-12.48	83.54	31.18	35.01	4.87	0.00	Peak	---	---

The item 1 is fundamental emissions.

Final Test Date	Apr. 09, 2012	Test Site No.	03CH02-HY
Temperature	23.9℃	Humidity	63%
Test Engineer	Streak	Configuration	802.11n (40MHz) Ch. 102, 110, 134

Channel 102

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5459.800	55.64	-7.90	63.54	15.67	35.07	4.90	0.00	Average	---	---
2 X	5499.900	96.40			56.39	35.10	4.91	0.00	Average	---	---
1	5459.800	68.67	-14.87	83.54	28.70	35.07	4.90	0.00	Peak	---	---
2 X	5496.600	107.43			67.42	35.10	4.91	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 110

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	5447.800	54.93	-8.61	63.54	14.96	35.07	4.90	0.00	Average	---	---
2 X	5539.300	95.57			55.51	35.13	4.93	0.00	Average	---	---
3	5725.000	55.03	-22.81	77.84	14.71	35.28	5.04	0.00	Average	---	---
1	5446.900	67.67	-15.87	83.54	27.70	35.07	4.90	0.00	Peak	---	---
2 X	5551.300	107.11			67.02	35.14	4.95	0.00	Peak	---	---
3	5725.300	68.01	-9.83	77.84	27.69	35.28	5.04	0.00	Peak	---	---

The item 2 is fundamental emissions.

Channel 134

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	5659.400	94.05			53.83	35.22	5.00	0.00	Average	---	---
2	5726.300	55.04	-22.80	77.84	14.72	35.28	5.04	0.00	Average	---	---
1 X	5675.400	105.62			65.36	35.24	5.02	0.00	Peak	---	---
2	5748.700	68.82	-9.02	77.84	28.46	35.29	5.07	0.00	Peak	---	---

The item 1 is fundamental emissions.

3.8 Frequency Stability Measurement

3.8.1 Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or $\pm 20\text{ppm}$ (IEEE 802.11a specification).

3.8.2 Measuring Instruments and Setting

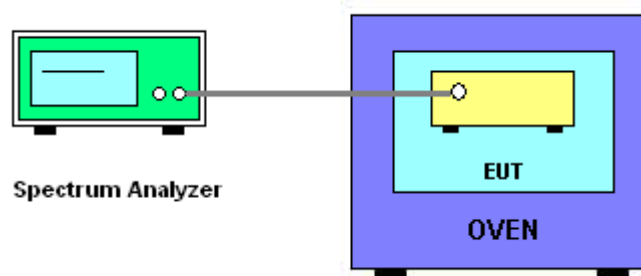
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

3.8.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than $\pm 20\text{ppm}$ (IEEE 802.11a specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is $-20^\circ\text{C} \sim 50^\circ\text{C}$.
8. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

3.8.4 Test Setup Layout



3.8.5 Test Deviation

There is no deviation with the original standard.

3.8.6 EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.8.7 Test Result of Frequency Stability**Voltage vs. Frequency Stability**

Voltage	Measurement Frequency (MHz)
(V)	5180 MHz
110.00	5180.0000
93.50	5179.9994
126.50	5179.9994
Max. Deviation (MHz)	0.0006
Max. Deviation (ppm)	0.12

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5180 MHz
50	5179.9526
40	5179.9640
30	5179.9796
20	5180.0006
10	5180.0198
0	5180.0252
-10	5180.0288
-20	5180.0282
Max. Deviation (MHz)	0.0474
Max. Deviation (ppm)	9.15

3.9 Antenna Requirements

3.9.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.9.2 Antenna Connector Construction

Please refer to section 2.2 in this test report; antenna connector complied with the requirements.

4 LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz ~ 2.75GHz	Feb. 08, 2012	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz ~ 30MHz	Jan. 12, 2012	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz ~ 30MHz	Feb. 20, 2012	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832010001	9kHz ~ 30MHz	Mar. 02, 2012	Conduction (CO01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 40	100305	9KHz ~ 40GHz	Feb. 21, 2012	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jun. 03, 2011	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Dec. 07, 2011	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 07, 2011	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	Jun. 16, 2011	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	Jun. 20, 2011	Conducted (TH01-HY)
RF Cable-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 03, 2011	Conducted (TH01-HY)
RF Cable-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 03, 2011	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jun. 09, 2011*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Aug. 08, 2011	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 11, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100kHz ~ 1.3GHz	Jul. 25, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1 Hz ~ 26.5GHz	Jul. 25, 2011	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz ~ 18GHz	Nov. 15, 2011	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Nov. 11, 2011	Radiation (03CH02-HY)
RF Cable-high	SUHNER	SUCOFLEX106	03CH02-HY	1GHz ~ 40GHz	Mar. 06, 2012	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Oct. 22, 2011	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0~ 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 ~ 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	Jul. 29, 2010*	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is two year.

5 TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei 221, Taiwan, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
LINKOU	ADD : No. 30-2, Dingfu Vil., Linkou Dist., New Taipei City 244, Taiwan, R.O.C. TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei 114, Taiwan, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei 235, Taiwan, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6 TAF CERTIFICATE OF ACCREDITATION


財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate No. : L1190-111208

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2010 to January 09, 2013
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities


Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 08, 2011

P1, total 24 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

Appendix A. RF Exposure Evaluation

1. Maximum Permissible Exposure

1.1. Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

1.3. Calculated Result and Limit**Antenna Type : Orinted Antenna****For Single Chain:****Max Conducted Power for IEEE 802.11a: 17.21dBm**

Test Frequency (MHz)	Min. User Distance (cm)	Gain (dBi)	Numeric Gain	Conducted Power (dBm)	Conducted Power (mW)	Power Density (mW/cm2)
5280	20	6.64	4.613176	17.21	52.6017	0.0483

For Two Chain:**Max Conducted Power for IEEE 802.11n: 19.82dBm**

Test Frequency (MHz)	Min. User Distance (cm)	Gain (dBi)	Numeric Gain	Conducted Power (dBm)	Conducted Power (mW)	Power Density (mW/cm2)
5260	20	6.64	4.613176	19.82	95.9401	0.0881

Appendix B. Test Photos

1 Photographs of Conducted Emissions Test Configuration

FRONT VIEW



REAR VIEW



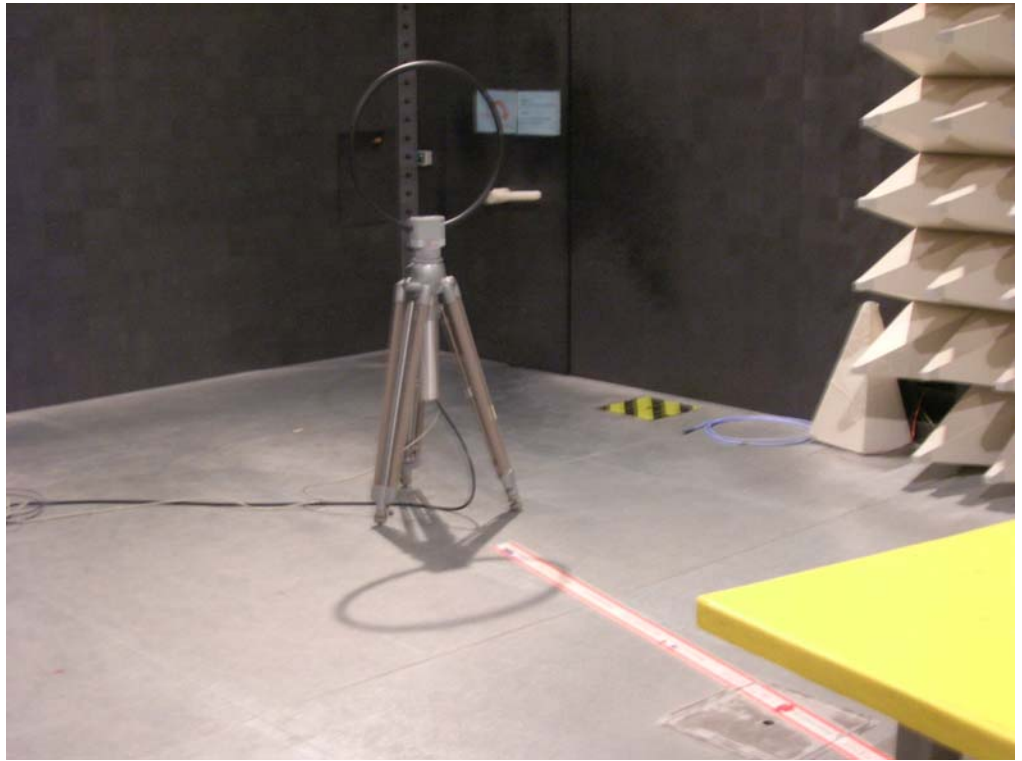
SIDE VIEW



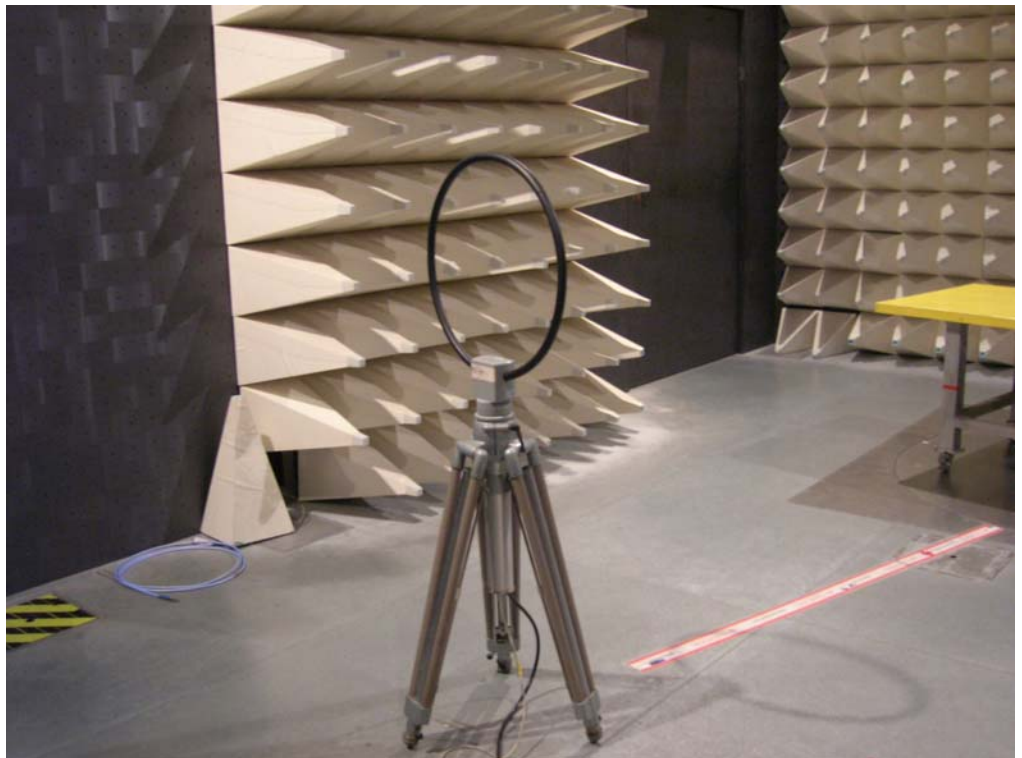
2 Photographs of Radiated Emissions Test Configuration

For radiated emissions 9kHz~30MHz

FRONT VIEW

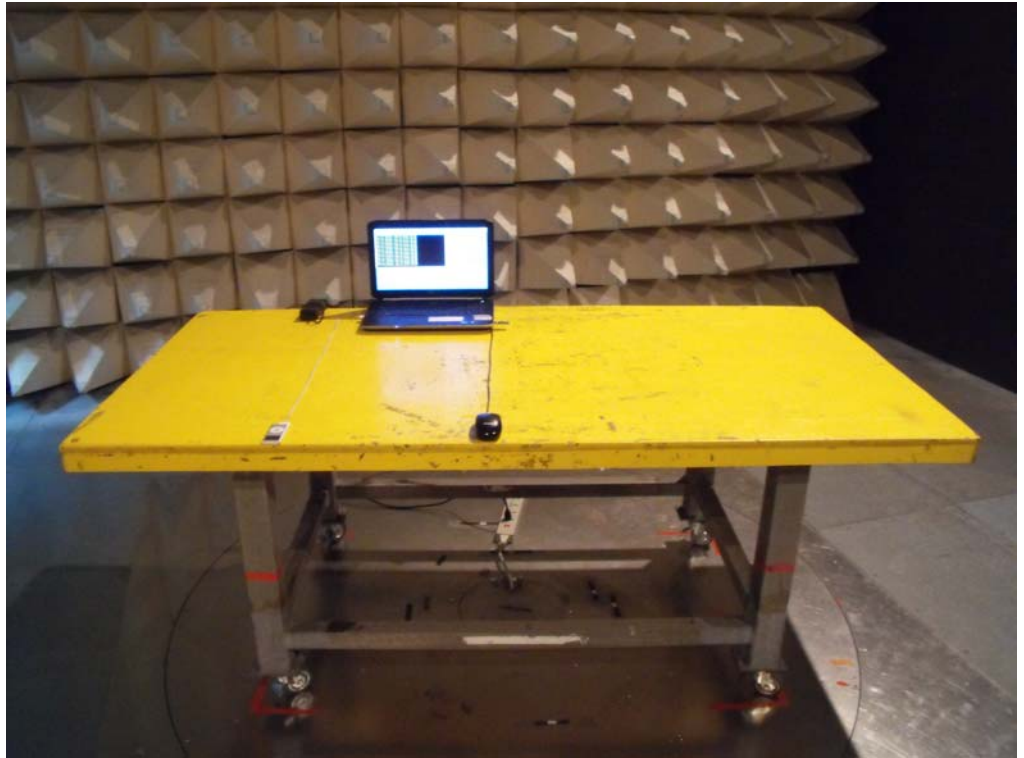


REAR VIEW

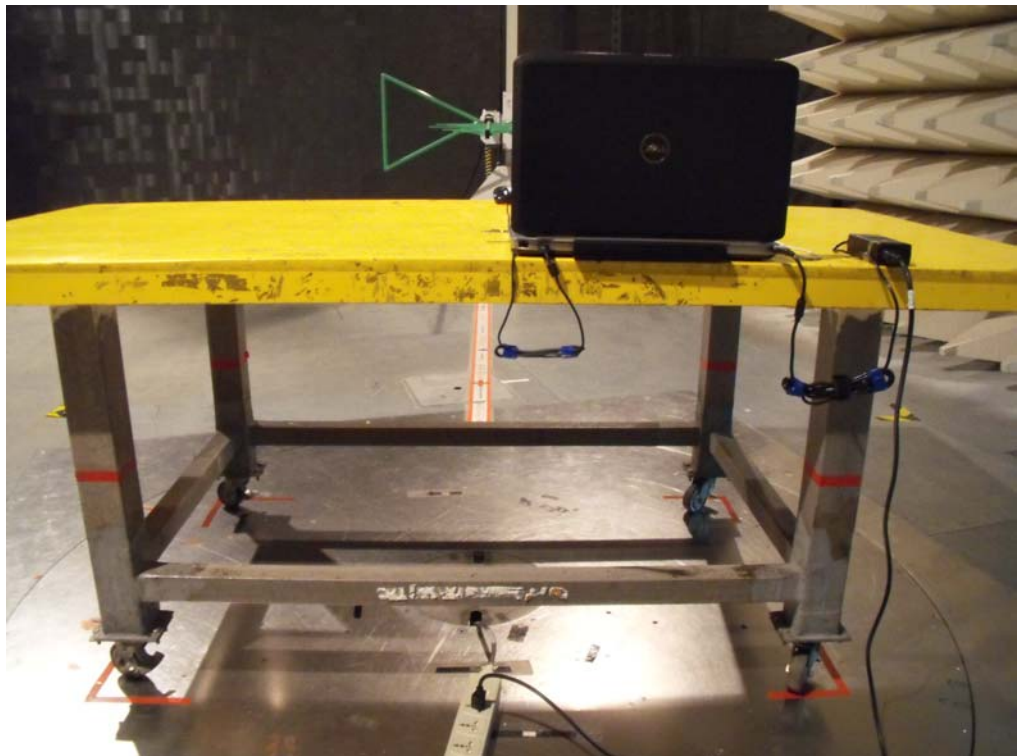


For radiated emissions 30MHz~1GHz

FRONT VIEW

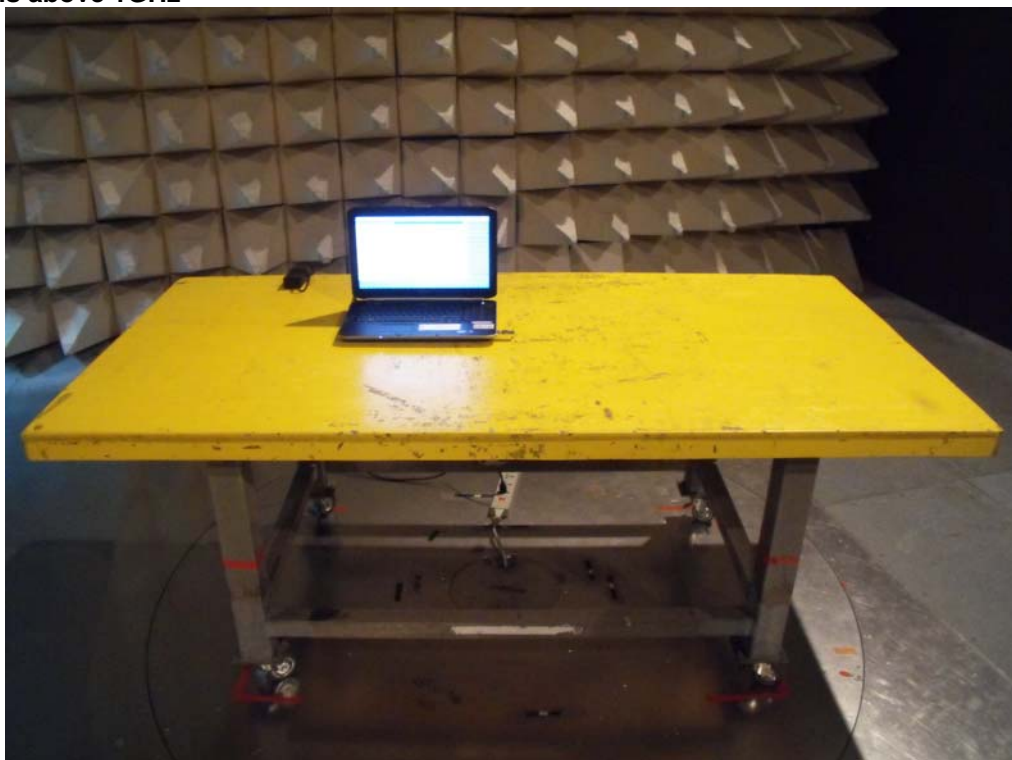


REAR VIEW

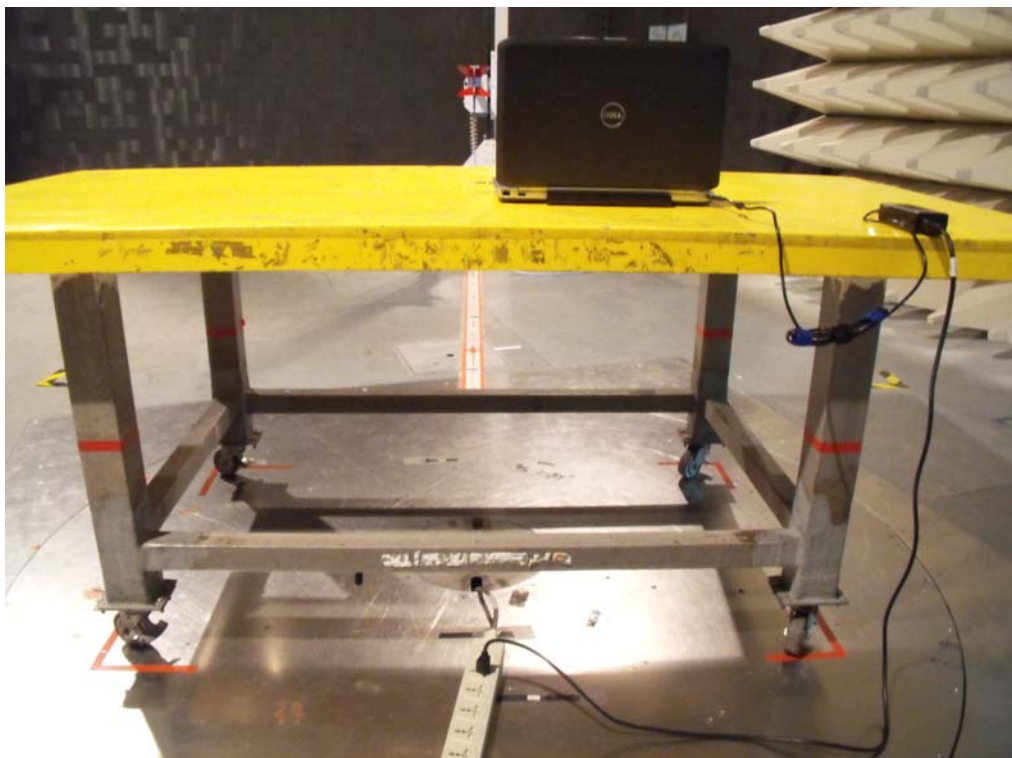


For radiated emissions above 1GHz

FRONT VIEW



REAR VIEW



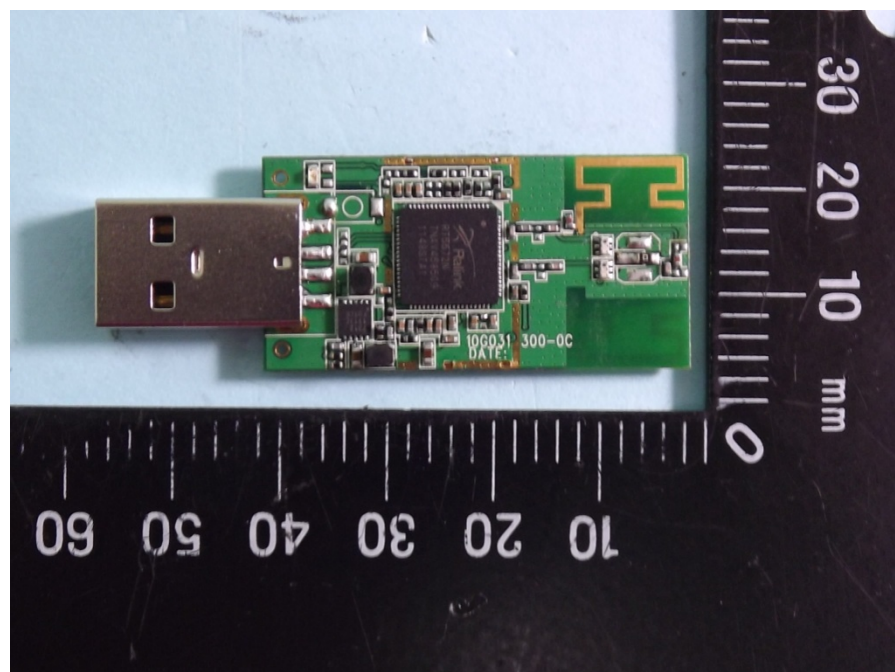
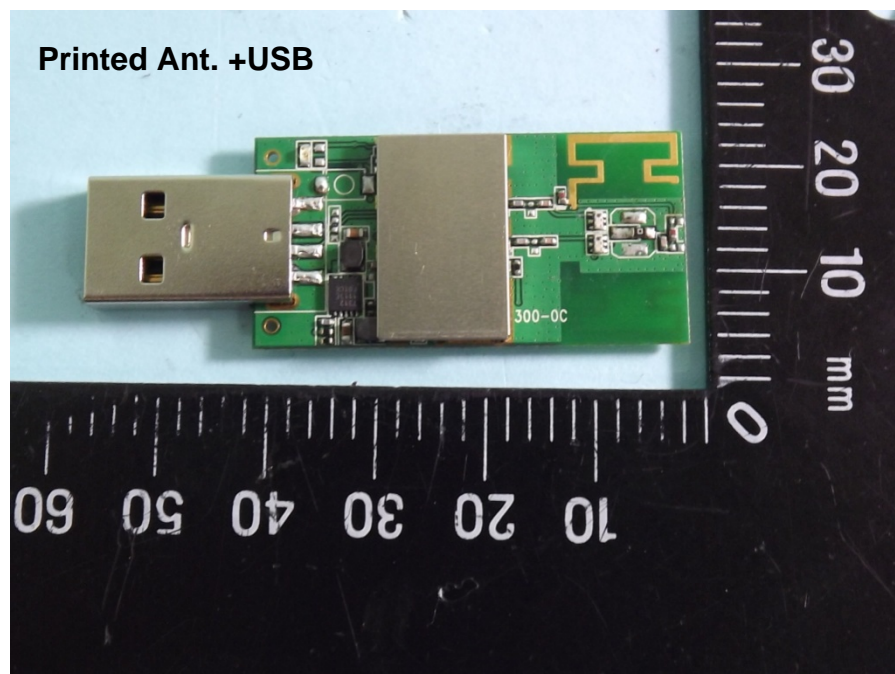
EUT take a close-up.

FRONT VIEW

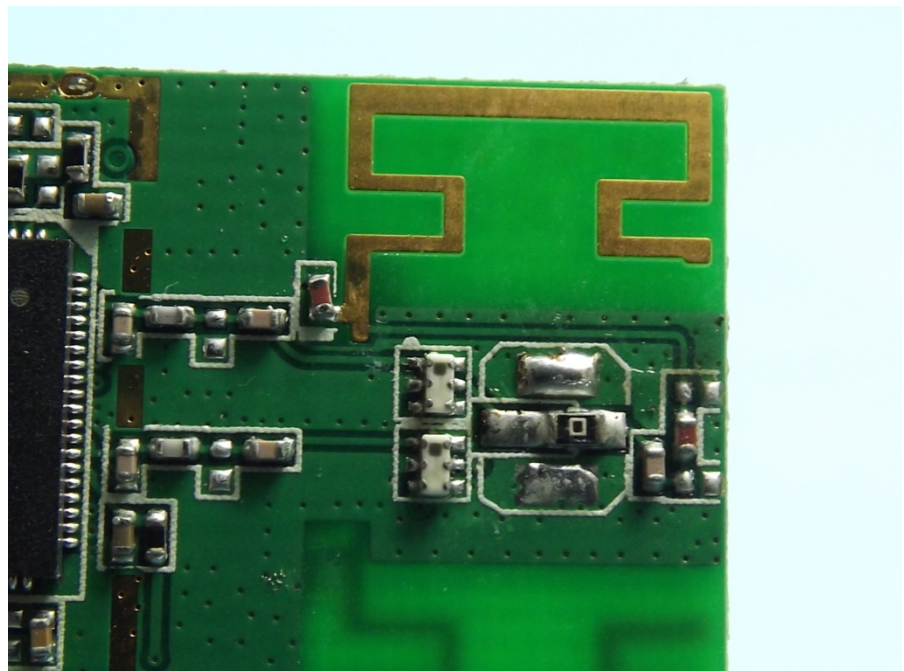


FCC TEST REPORT

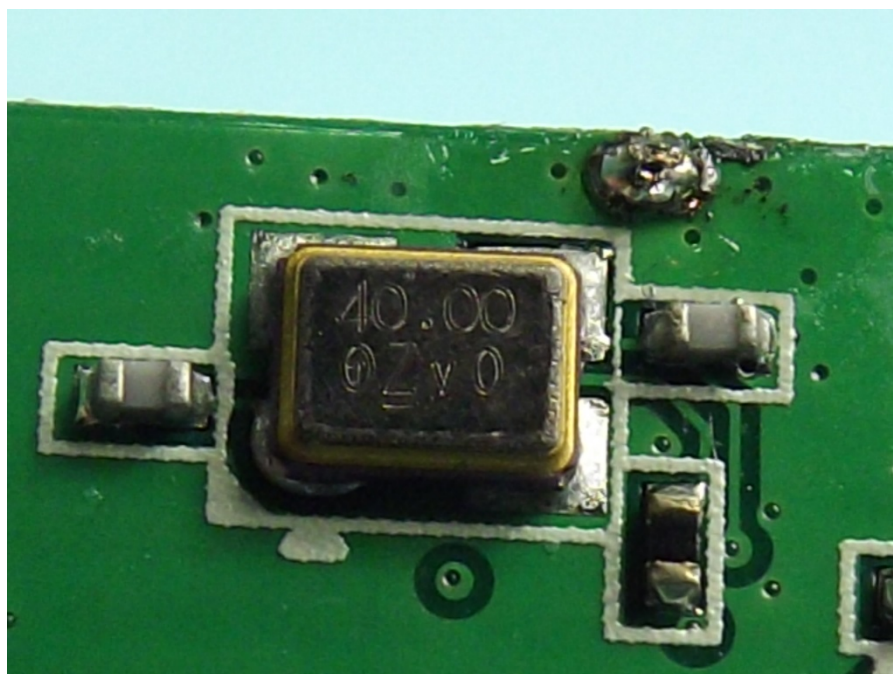
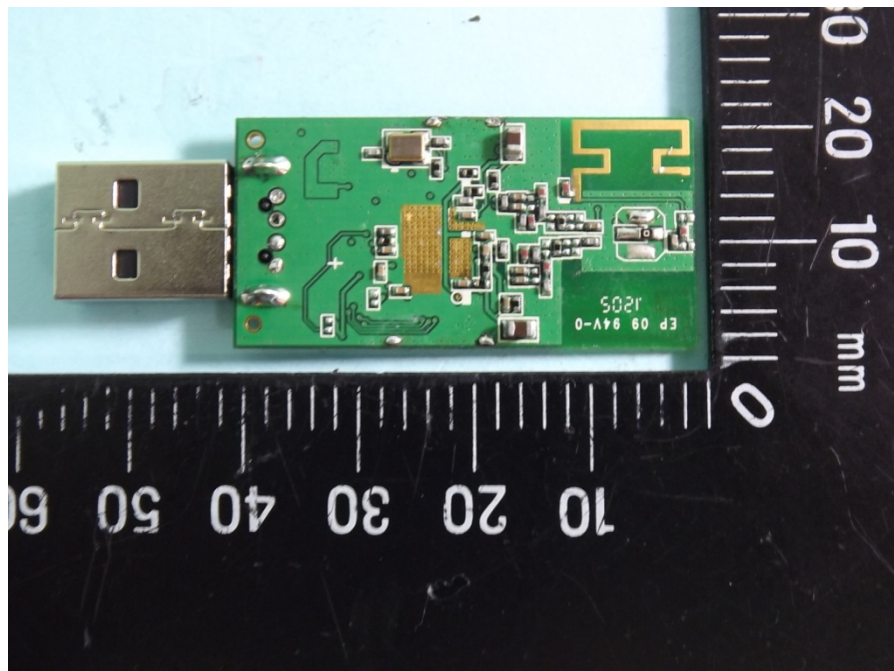
APPENDIX C. Photographs of EUT



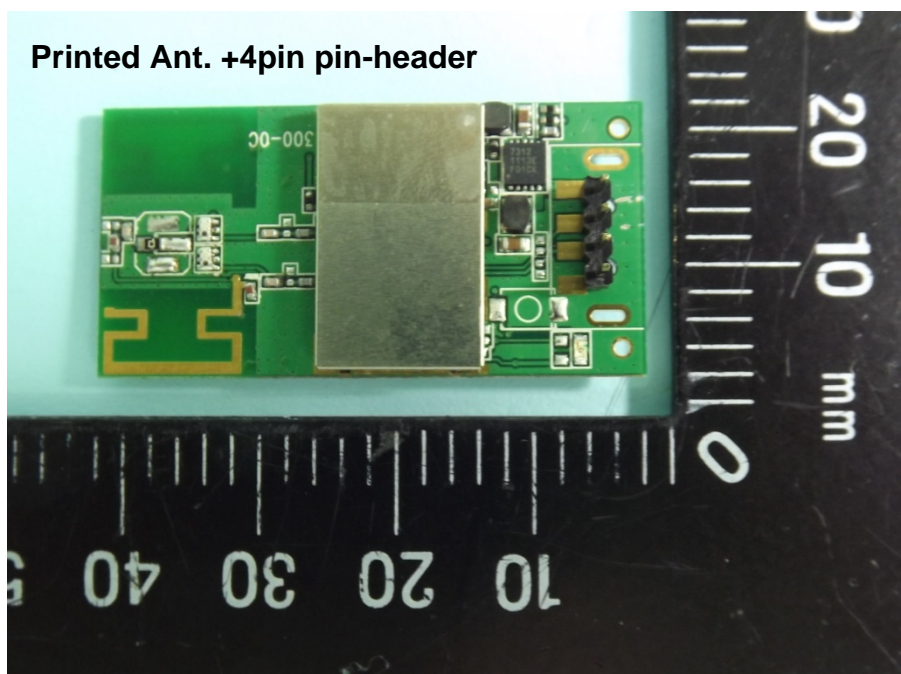
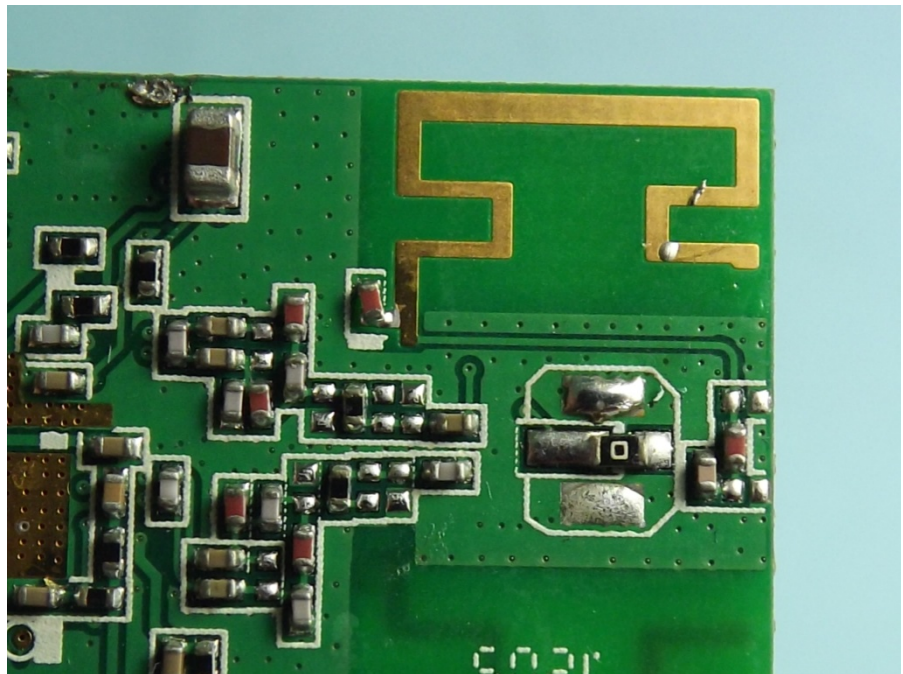
FCC TEST REPORT



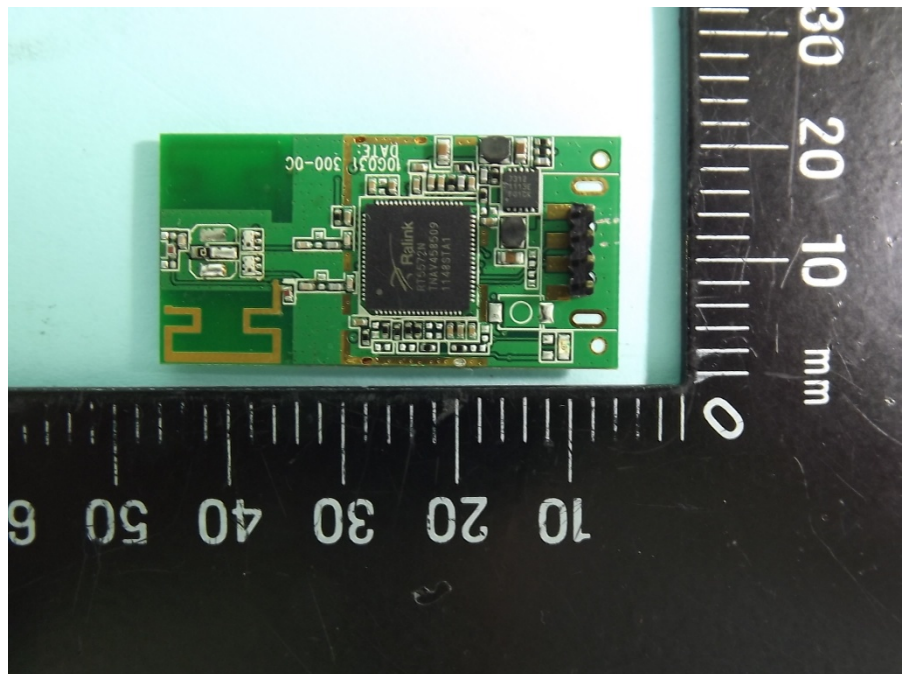
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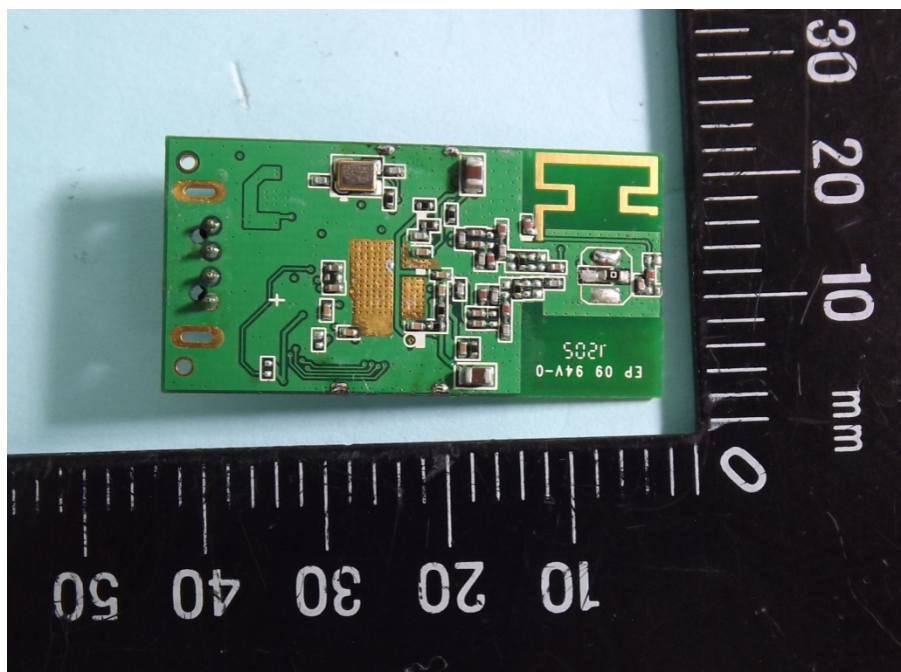
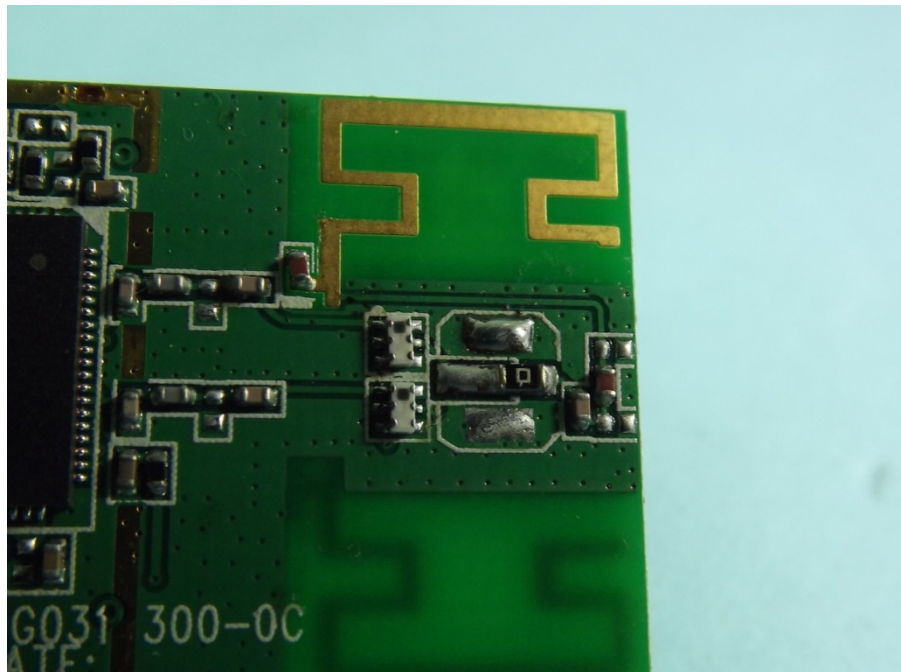
FCC TEST REPORT



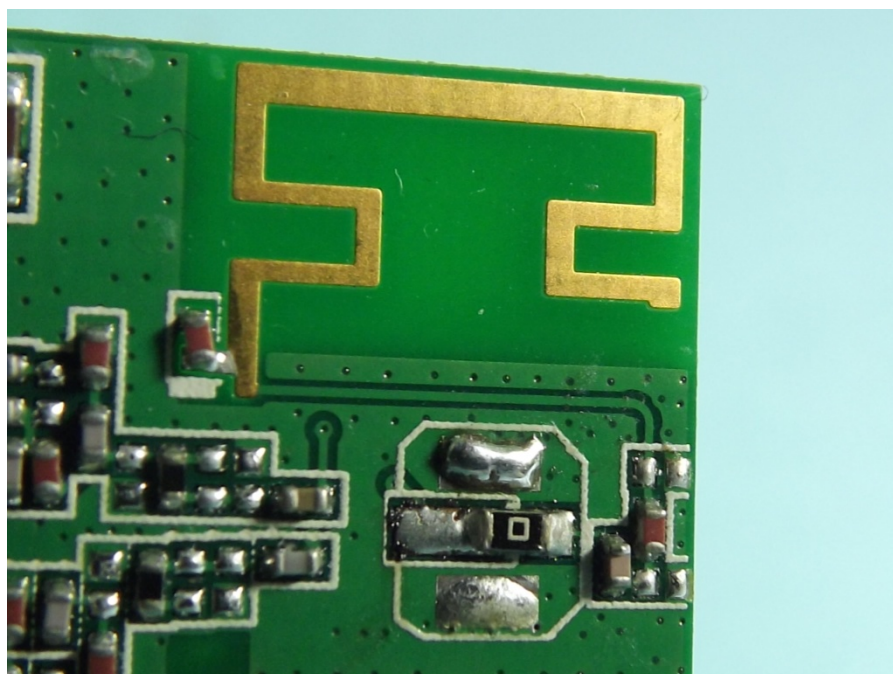
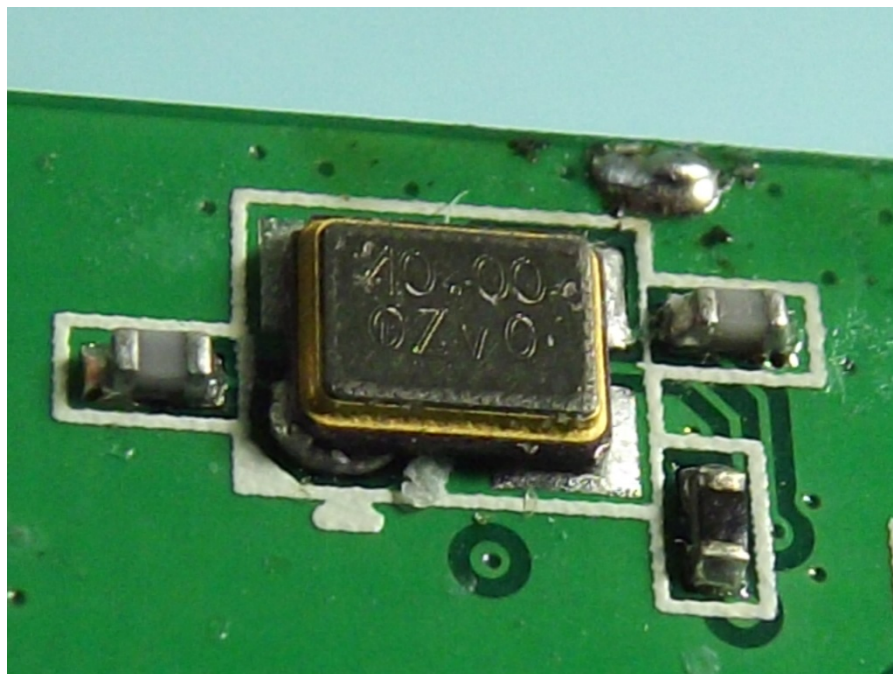
FCC TEST REPORT



FCC TEST REPORT

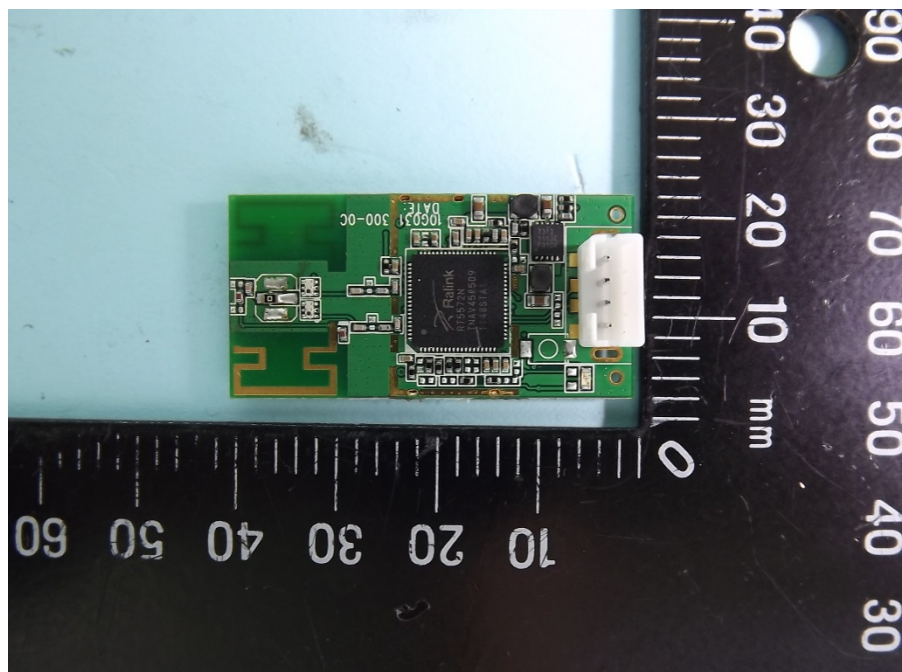
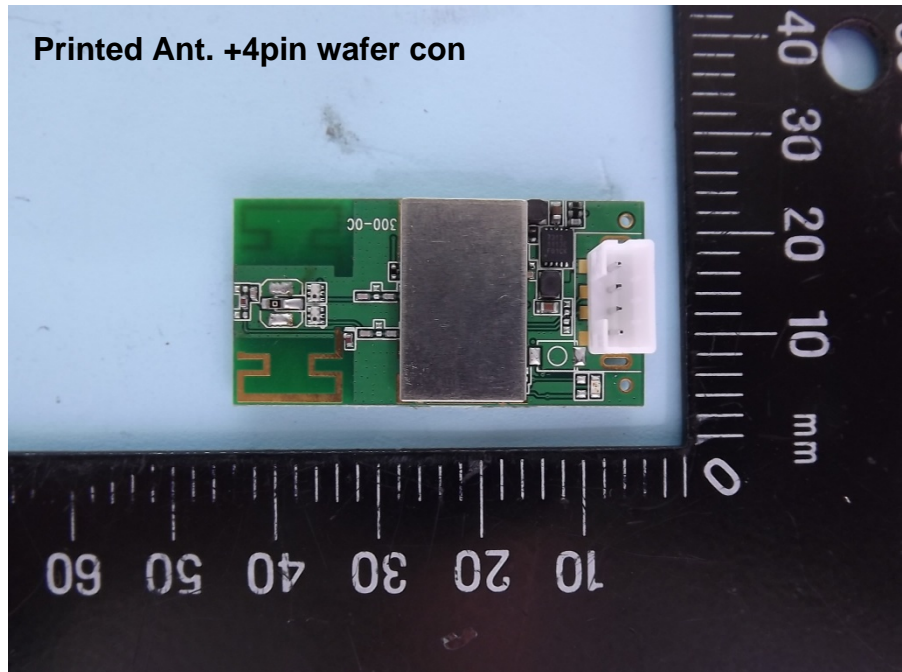


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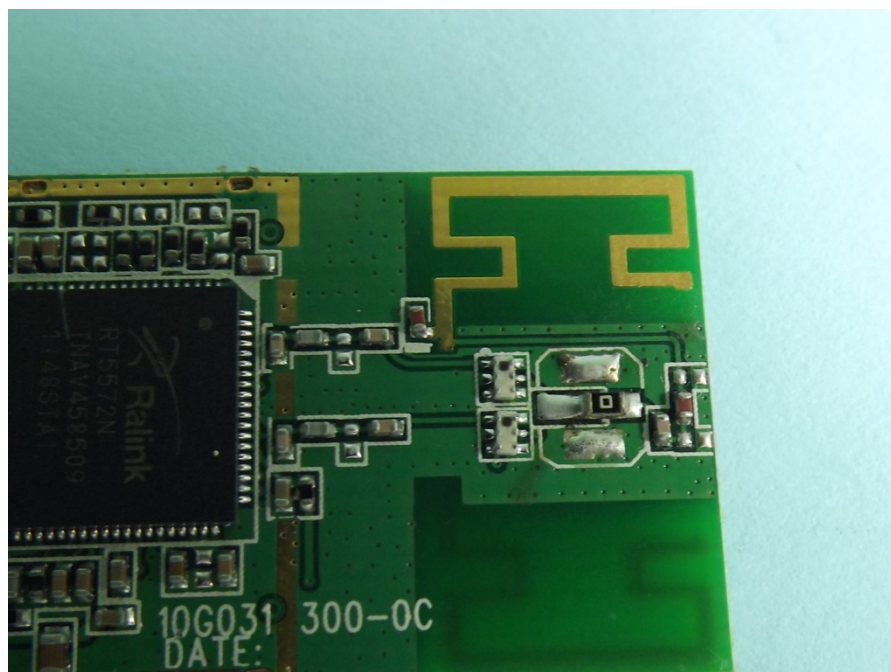


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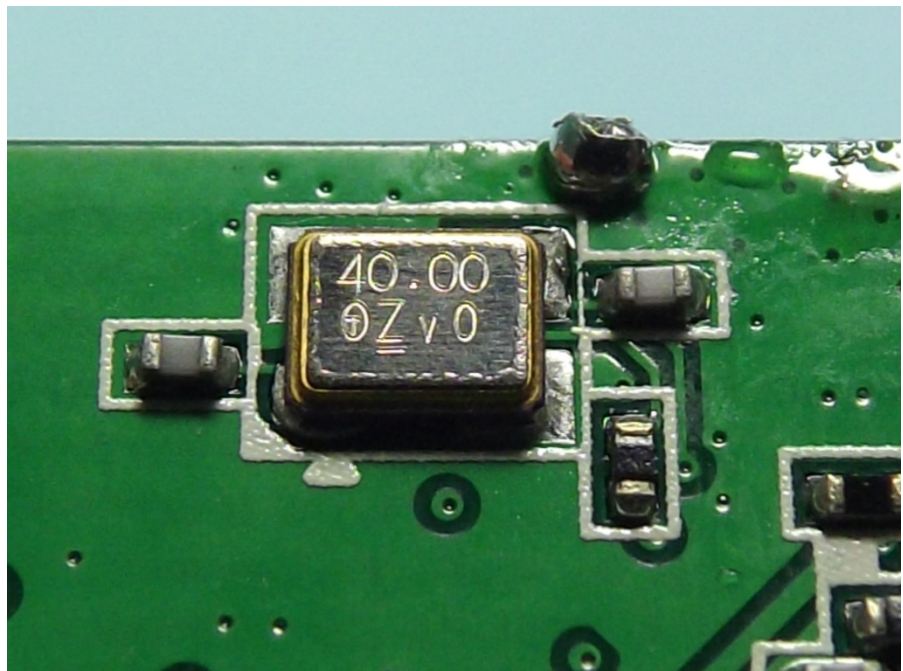
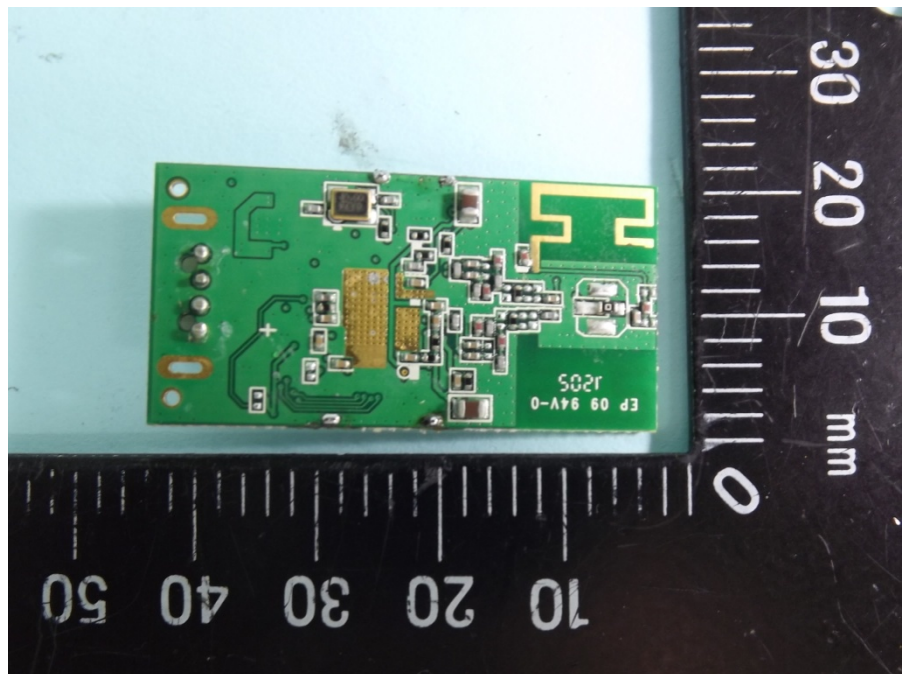
Printed Ant. +4pin wafer con



FCC TEST REPORT



FCC TEST REPORT



FCC TEST REPORT

